

COAL AGE

The Weekly Journal of the Coal and Coke Industries

Volume 18

NEW YORK, THURSDAY, JULY 15, 1920

Number 3

Survival of the Flivverest

HENRY FORD and his son, Edsel B. Ford, have bought the Detroit, Toledo & Ironton Ry. to protect their coal supply. Thus are essential industries, like transportation, with regulated prices absorbed by the less essential industries that are operated without control.

This purchase is a symbol. The less-needed are absorbing the more-needed at a bargain, for the more-needed are impoverished by regulation and fail to function properly for lack of blood of new capital. Their resulting inefficiency vexes sorely the spirits of the unregulated, who are unaccustomed to have their slightest wishes curbed. As the less-needed industries have the money, they buy and operate the more-needed which have been put to sore straits for lack of capital.

Before the war, when the coal mines were impoverished though without regulation, the less-needed industries purchased coal mines for a song. This is the first railroad that the automobile industry has purchased. More such purchases are likely to follow. We shall soon have railroads owned by all kinds of incidental industry, and victory will ever be with the flivverest.

Not Much Thought for Public

TO REFUSE arbitration regarding the fulfillment of contracts and to restrict the output of commodities in order to gain points in industrial disputes are actions singularly out of place in the United States. Yet threats that resort will be made to both have been made before the U. S. Anthracite Coal Commission that is now sitting in Scranton and is about to pass judgment on the eighteen points at issue between the anthracite operators and the mine workers.

While only one man, Thomas Kennedy, the president of district No. 7, has given expression to such sentiments, his remarks have met with no disclaimers on the part of other representatives of the organization, and for all that the record shows to the contrary they have met with approval.

Mr. Kennedy's first intimation of radical action came at an early meeting in Scranton, when he said that failure to establish a closed shop might mean the abolition of the Board of Conciliation and the settlement of all future disputes by an appeal to force in the shape of a strike, a policy which, he said, the miners were ready to adopt. To quote his expressive phraseology, the mine workers were ready at any time "to go to bat."

His second contribution to a program of radicalism in which the public would be the sufferers was made on July 8, when he opposed an attempt to show that steadier work had rendered the mine workers' pay adequate to meet their living expenses. He declared

that the operators were trying to "penalize" the workman for steady work and asked, "If you insist on penalizing the men wouldn't we be justified in issuing an order to revert to the 1914 production?"

He was answered by a dignified statement from S. B. Warriner, president of the Lehigh Coal & Navigation Co., to the effect that such action would be an attack on the public interest, and so it would be. The mine workers, as an organization, have predicated part of their demands upon a statement to the effect that the union has been a potent force in the improvement of general conditions in the anthracite region, that it has won the right to recognition for its service, but Mr. Kennedy's intimations lead to the inference that some of its spokesmen, at least, have visions of mastery rather than service, and are willing to bludgeon the public with strikes and reduced coal allowances if by that means they can prove to their following the merits of their organization as adjunct to wage profiteering.

Who Is Entitled to Coal?

ONE of the first big questions that must be met by the Government and the coal men in any program of distribution is that having to do with preference in supply. The problem in its essentials is no different now than during the war. Geographic distribution on the one hand, exemplified by New England and the Northwest, and use distribution on the other hand, at present typified by the needs of the railroads and the public utilities, are the two aspects of the problem that must be met.

If we proceed on the assumption that there is not sufficient coal for every one and that some must be supplied ahead of others until such time as production is increased, priority in use must first be defined and established. The first move on the part of the Interstate Commerce Commission in the present situation was in this direction—on April 16 the railroads were given a priority in the shape of assigned cars for fuel coal. Order No. 8, giving the Philadelphia Electric Co. assigned cars, was the second move in recognition of this principle of use priority.

We do not believe it is safe or proper to go farther in setting up a "preference list" today than to specify transportation and heat, light and food for the comfort and necessity of man and beast. To this list the Government will of course add newspapers. To define and administer preference in coal supply to such a list, simple and obvious as it appears, is no simple task.

Because a consumer of coal manufactures power for sale and therefore falls within the legal definition of a public utility is no reason for giving public utilities preference in coal supply. Only so far as the power and gas produced are used for transportation and for the protection of life should preference be recognized.

The Coal Situation in New England

A Statistical Summary of the Position of New England
With Regard To Bituminous Coal Supply and Requirements

BY C. E. LESHER

BITUMINOUS coal reaches New England by two routes, all rail from the coal fields in Pennsylvania and to some extent from those of Maryland and northern West Virginia, and by rail and water mainly from the coal fields in southern West Virginia and Virginia through the port of Hampton Roads and to a lesser extent from the fields in northern West Virginia, Maryland and Pennsylvania through the ports of Baltimore, Philadelphia and New York. The receipts of bituminous coal in New England in recent years, exclusive of imports from Nova Scotia of about 100,000 net tons, have ranged from 23,500,000 net tons in 1917 to 27,100,000 net tons in 1918. The statistics of receipts in 1919 are not available, but it is conceded that the quantity of soft coal bought by New England in 1919 was below that in any recent year—estimated at about 17,400,000 net tons.

RECEIPTS OF BITUMINOUS COAL IN NEW ENGLAND, 1916-1919
(NET TONS)

Year	By Rail	By Tidewater	Total
1916	9,900,000	14,200,000	24,100,000
1917	10,800,000	12,700,000	23,500,000
1918	11,100,000	16,000,000	27,100,000
1919a	9,000,000	8,400,000	17,400,000

(a) Estimated.

It will be noted that the proportion of the total that was shipped by all rail was 41 per cent in 1916, 46 per cent in 1917, 41 per cent in 1918 and is estimated at 51 per cent in 1919. At the present time receipts are about equally divided between rail and water. From 1916 to date the proportion of all-rail coal bought by New England has increased each year except during the war year of 1918, when the distribution was under the absolute direction of the Fuel Administration.

New England has been compared with the Northwest—the region at the head of the Great Lakes—in respect to urgency of coal supplies, inasmuch as both of these markets are far removed from the coal fields. The Northwest depends for by far the greater part of its coal on Eastern fields shipping via the Lakes, a route that is open at best but eight months of the year. During the war the Fuel Administration recognized the claim of New England to preference in supplies of soft coal in the summer months by providing that 60 per cent of the total allotment for the year should be transported in the six months beginning with April, and the remaining 40 per cent in the six months from October to March. Under normal conditions New England did not receive coal at so much greater a rate in the summer months as the following data indicate:

DIVISION OF SHIPMENTS OF BITUMINOUS COAL TO NEW ENGLAND
BETWEEN SUMMER AND WINTER, 1914-1918

	1914-15	1915-16	1916-17	1917-18
Percentage of shipments summer months (April—September).....	49	45	52	55.5
Percentage of shipments winter months (October—March).....	51	55	48	45.5

In the calendar year 1919 shipments by tide to New England were 54.8 per cent in the six months beginning with April and 45.2 per cent in the months of January to March and October to December. It should be noted that the shipments in the months of November and December were arbitrarily reduced by the Government during the coal miners' strike, because that section of the country had on Nov. 1, 1919, a better stock of soft coal than any other part of the United States.

Shipments of bituminous coal to New England by tidewater for commercial uses as differentiated from railroad fuel and as shipped through the port of Hampton Roads and the three northern Atlantic ports are given in the following table. It will be noted that shipments were at their highest rate in 1918, the war year, and were greatly reduced in 1919, and that the three Northern ports supply the greater proportion of railroad fuel that reaches New England by water. The division of the tonnage in 1919 between commercial and railroad fuel is not at present available.

SHIPMENTS OF BITUMINOUS COAL TO NEW ENGLAND BY
TIDEWATER (IN NET TONS)

	1917	New York, Philadelphia, Baltimore	Total
Commercial.....	6,632,850	2,317,289	8,950,139
Railway fuel.....	1,325,300	1,993,041	3,318,341
Total.....	7,958,150	4,310,330	12,268,480
	1918		
Commercial.....	8,261,864	3,991,691	12,253,555
Railway fuel.....	795,550	2,601,814	3,397,364
Total.....	9,057,414	6,593,505	15,650,919
	1919		
Total.....	5,550,000	2,835,000	8,385,000

Cargo coal for New England and for foreign countries (exports) represents but a part of the business done in coal over the tidewater piers, bunker supplies for steamships and local requirements as well as the United States Navy taking a large portion of the coal dumped. At New York the main business is bunkering ships, at Hampton Roads the larger portion of the coal is loaded as cargo. The relation of New England and foreign countries to the total tidewater business done in the years 1917, 1918 and 1919 at Hampton Roads and at the three Northern ports is given in the following table. At Hampton Roads 45.8 per cent of the total coal dumped was for New England in 1917, compared with 45 per cent in 1918 and 38 per cent in 1919. From the three Northern ports the percentage of the total shipped to New England increased from 21.6 in 1917 to 27.6 in 1918, but dropped to 22.7 in 1919. New England received about one-third of the total soft coal dumped at these four ports in 1917, 36.5 per cent in 1918 and 31 per cent in 1919.

Exports represent 27 per cent of the total dumped at Hampton Roads in 1917 and 33.5 per cent in 1919, compared with 4.3 per cent in 1917 at the three Northern ports and 27.3 per cent in 1919. During the war year,

1918, exports were greatly reduced below 1917 and were but 8.9 per cent of the total coal dumped at all four ports, compared with 14.8 per cent in 1917 and 30.7 per cent in 1919.

TOTAL TIDEWATER SHIPMENT, COASTWISE MOVEMENT TO NEW ENGLAND, AND EXPORTS AT NORTH ATLANTIC SEAPORTS (IN NET TONS)

Port	1917		Exports		Total Dumped at Tide, Tons
	Tons	Per Cent	Tons	Per Cent	
Hampton Roads.....	7,958,150	45.8	4,659,009	27.0	17,380,075
New York, Philadelphia and Baltimore.....	4,310,330	21.6	856,625	4.3	19,888,891
Total.....	12,268,480	33.0	5,515,634	14.8	37,268,966
1918					
Hampton Roads.....	9,057,414	45.0	3,607,232	19.0	18,951,849
New York, Philadelphia and Baltimore.....	6,593,505	27.6	220,730	0.9	23,938,105
Total.....	15,650,919	36.5	3,827,962	8.9	42,889,954
1919					
Hampton Roads.....	5,550,000	38.0	4,900,000	33.5	14,600,000
New York, Philadelphia and Baltimore.....	2,835,000	22.7	3,391,000	27.3	12,462,000
Total.....	8,385,000	31.0	8,291,000	30.7	27,062,000

Hampton Roads is the principal supplier of bituminous coal for cargo, both to New England and for export. The coal fields on the Norfolk & Western, the Chesapeake & Ohio and Virginian railroads are tributary to Hampton Roads, but of these fields the "smokeless" field, including the Pocahontas, Tug River, New River and Winding Gulf districts, furnishes the greater part of the coal that is dumped either for foreign export or for New England. In 1917 the production of coal in the smokeless field was 40,000,000 net tons, of which about 4,200,000 net tons, or 10 per cent, was exported through Hampton Roads.

During the war, and under the control of the Fuel Administration, exports were limited, amounting to about 3,500,000 net tons, or 9.4 per cent of the smokeless output in 1918. Removed from Governmental restrictions in 1919 and with a foreign demand surpassing the domestic call for coal, exports began an upward climb limited throughout the year, first by lack of ships and later by the Government during the miners' strike. Official figures of the production of smokeless coal in 1919 are not yet available, but the output is estimated at 36,000,000 net tons, of which about 4,700,000 net tons, or 13 per cent, were exported through Hampton Roads.

The consumption of bituminous coal in New England in 1917, as reported by the Geological Survey, was 24,744,000 net tons. Railroad fuel represented one quarter of the total, public utility plants and domestic consumers, including coal used in the heating of office buildings, hospitals, etc., took another quarter of the total, and the remaining half was used by industries and for local steamship bunkers.

CONSUMPTION OF BITUMINOUS COAL IN NEW ENGLAND, 1917

Use:	Net Tons	Per Cent of Total
Byproduct coke.....	738,873	.....
Coal gas.....	893,488	.....
Electric utilities.....	2,890,733	.....
Total public utilities.....	4,523,094	18.3
Domestic.....	1,655,000	6.7
	6,178,094	25.0
Industries.....	12,026,293	48.5
Railroads.....	6,540,000	26.5
Totals.....	24,744,387	100.0

Consumption of bituminous coal in New England in 1918 has not been officially estimated, but it was much less than the receipts of 27,100,000 net tons, as is indicated by the fact that receipts in the following year, 1919, were less than 18,000,000 tons. The average receipts for the two years ended December, 1919, were about 22,000,000 tons, and this figure probably is not far from the average consumption. In 1919 industry and the railroads used less coal than in 1918 because of lessened activity and, in the case of the industrial plants, by reason of increased use of fuel oil.

STOCKS OF BITUMINOUS COAL IN NEW ENGLAND

Such information as is available on stocks of bituminous coal in New England indicates that the supply today is much below that at any time in 1918. The railroads are in even greater straits, stocks being lower than in any year at midsummer for which there is record.

STOCKS OF BITUMINOUS COAL IN THE HANDS OF INDUSTRIAL AND GAS PLANTS IN NEW ENGLAND

State	Industrials 1918		1920	
	No. Plants	Week's Supply, Aug. 17	No. Plants	Week's Supply, May 1 June 1
Connecticut.....	1,338	13	84	5 4
Massachusetts.....	2,843	14	299	6 5
Maine.....	329	16	23	5 6
New Hampshire.....	276	20	37	7 5
Rhode Island.....	496	15	66	6 6
Vermont.....	240	18	41	7 6
Gas				
Connecticut.....	6	8	2	7 5
Massachusetts.....	28	11	9	7 2
Maine.....	7	29	...	...
New Hampshire.....	3	12	3	11 10
Rhode Island.....	2	34	2	7 5
Vermont.....	2	8	...	...

Railroads in New England consume an average of 500,000 net tons of bituminous coal a month, or about 6,000,000 tons a year. Stocks on hand on July 1, 1916, were sufficient for about eight weeks; on July 1, 1917, for a little more than eight weeks; on July 1, 1918, stocks were sufficient for between four and five weeks. In the winter months the railroads in New England endeavor to have on hand from ten to twelve weeks' supply, or more than 1,200,000 tons of coal.

On June 15, 1920, that is a month ago, the Boston & Maine and the Maine Central railroads are reported to have had two weeks' stocks of coal, or about 100,000 tons. The New Haven had four days' supply and the Boston & Albany two days' supply.

RECEIPTS OF BITUMINOUS COAL IN 1920

At the four Atlantic ports, Hampton Roads and north, there was dumped for New England in the first five months of 1920 4,044,000 net tons of soft coal. Rail receipts through the all-rail gateways are estimated at 3,750,000 tons in the same period. In other words, the receipts of bituminous coal in New England are now at the rate of 18,700,000 net tons a year. Although this figure is 1,300,000 tons greater than the estimated receipts in 1919, it should be remembered that New England began 1919 with the largest stocks of soft coal ever held in that section and reached the end of the year with the smallest. Any estimate of requirements for the remainder of this year must take into account the obvious fact that consumption of bituminous coal in New England is now proceeding at a rate greater than current receipts and that stocks are below the usual margin for this time of year and must be increased if industry is not to suffer interruption next winter.

Shipping Board Seeks Bids for Bunker Oil

The Shipping Board has advertised for bids to be opened July 15 for grade C bunker oil for one, three and five years beginning Sept. 1, 1920.

Huge Coal-Storage Plant Completed

A coal-storage plant said to be the largest in the world, for the Clairton Byproduct Coal Co., at Clairton, Pa., has just been completed. The coal storage pile will have a base 600 by 800 feet, or a trifle over 11 acres. This will accommodate 300,000 tons of coal. The coal will be handled from barge to storage and to cars by a traveling crane, 600 feet between centers with a travel of 800 feet. The bridge will be equipped with two hoists, each with 5-ton buckets, which can be operated separately or together, as required.

War Debt Reduced Two Billions from Peak

According to the quarterly debt statement issued recently by the Treasury the public debt decreased by more than a billion dollars during the fiscal year of 1919, just ended, and by more than two billion dollars since last Aug. 31, when the war debt was at its peak. On June 30 the public debt was \$24,299,321,467.07, a decline of \$2,295,380,180.94 from the peak figure of \$26,596,701,648.01 on Aug. 31. The decrease for the period from May 31 to June 30 was \$675,641,559.72.

Expect Advance in Freight Rates Within 30 Days

Now that presentation of testimony and argument for advance of freight rates have been completed before the Interstate Commerce Commission, a decision is expected within the next thirty days. It is generally believed the commission will grant increased rates in order that the railroads may receive additional revenue to meet increased labor and other costs.

Wheat Variable, but Corn and Cotton Are Late

In its crop report for the week ending July 3 the American Steel & Wire Co. summarizes conditions as follows: "The effects of late spring not yet overcome. More growing weather needed. Wheat condition in important belt improving; disappointing in localities outside of belt. Corn still late and needs continuous hot days and nights; crop is very clean. Oats show short straw. Grasslands are weedy. Cot-

ton continues late and the boll weevil a great menace. Livestock situation continues unsatisfactory; short pig crop; high price of feed, coupled with low price of animals. Dairying and poultry raising showing unrest. Irish potato acreage being kept up by high prices."

Campaign for Higher Gas Rates

As has been made known to the public in recent suits at law and in equity, and applications heard by public service commissions, the gas companies claim that because of increased prices of gas oil, labor, etc., present prices for illuminating gas are inadequate. Now the American Gas Association has established

NEWS BRIEFS

Terse Items Chronicling Events of Interest to the Industry

headquarters in New York, from which a campaign is to be carried on throughout the country for the education of the public in the necessity of higher gas rates.

Foreign Trade Hearings Begun

The Central Foreign Trade Committee, organized by the State Department under an order of President Wilson, dated Feb. 28, 1919, for the purpose of considering and making suggestions concerning questions of foreign trade and commerce with a view to promoting full co-ordination and effort, has resumed its sessions. Hearings have already begun, and at a meeting recently held at the State Department thirteen different governmental departments and commissions, which are concerned directly or indirectly in various ways with foreign trade matters, were represented.

Movement of Coal Through "Soo" Canals

West-bound shipments of coal in net tons through canals at Sault Ste. Marie, Mich., and Ontario for the month of June, 1920, as reported by L. C. Sabin, general superintendent, St. Marys Falls Canal, Mich., were as follows:

	U. S. Canal	Can. Canal	Totals
Coal, soft....	941,894	24,488	966,382
Coal, hard....	263,120	7,900	271,020

American Marine Insurance Pool Nearly Effectuated

The pool of American insurance companies to underwrite the American merchant marine is now nearly effectuated. It follows promptly the granting of such authority by the Jones Merchant Marine Bill, recently passed. The pooling will allow the elimination of foreign insurance companies.

Pig Iron Output Larger but Still Below Peak

In its weekly summary of the iron market as of July 8 the *Iron Age* says: "Pig iron output increased in June, showing that the net result of all the shifts in the railroad situation was favorable. At 3,043,540 tons for the thirty days the daily average was 101,451 tons, a gain of about 5,000 tons a day upon the May output, which was 2,985,682 tons for thirty-one days. May in turn showed a gain of 5,000 tons a day over April. But the industry is still nearly 7,500 tons a day below the peak reached in March, when the daily average was 108,900 tons."

Hearing Arranged in Plan to Deepen the St. Lawrence

The international joint commission to report on the question of deepening the St. Lawrence will hold public hearings in New York City beginning October 15. Engineers appointed by the United States and Canadian governments are now making surveys. The idea is to open up a deep sea route to the Middle West.

Says Railroads Ask for More Than They Need

Clifford Thorne, representing Western shippers, told the Interstate Commerce Commission that the \$1,000,000,000 increase asked by the railroads is \$386,000,000 more than is necessary to give them a 6-per cent standard return as guaranteed under the Transportation Act. He stated that the book value of \$20,600,000,000 used by the roads in computing the return was several billions in excess of the true amount.

A Busy Week for Coal Operators

This week promises to be a busy one for coal operators. A general meeting for Monday called by the National Coal Association to discuss the general situation, which is fast becoming critical, was followed by a meeting of the West Virginia operators in Washington. The meeting of the board of directors of the National Association scheduled for Wednesday was to be preceded by that of several special committees.

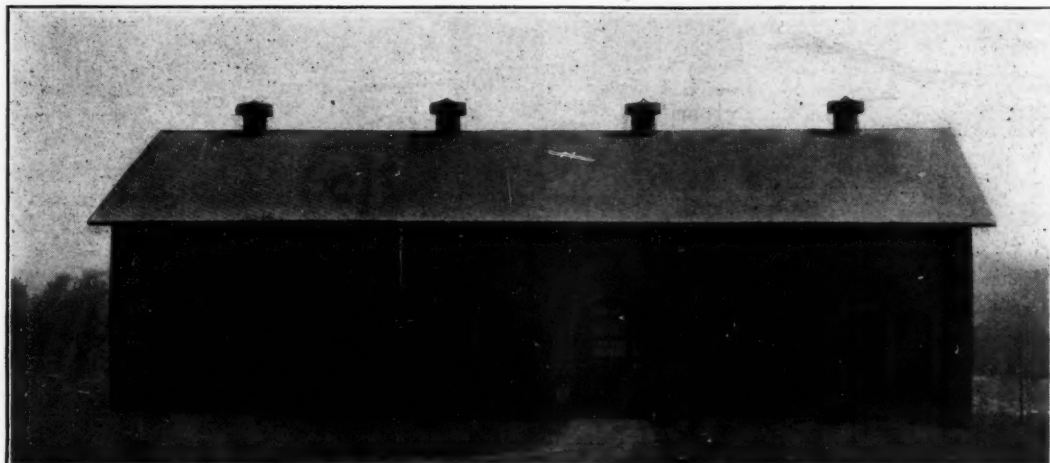


FIG. 1.

No. 35 Substation

At the right the high-tension power lines may be seen entering the building.

Ventilating an Extensive Thin-Coal Mine

Air Is Forced Into One End of the Mine and Sucked Out at the Other—Rope Drive Between Exhaust Fan and Actuating Motors Forms Excellent Medium of Power Transmission—Fan Shaft Provides Means for a Second Mine Exit and for Boosting Voltage

BY DONALD J. BAKER
Wilkesburg, Pa.

AT THE No. 35 mine of the Berwind-White Coal Mining Co. the main entries have been driven back for so great a distance from the drift opening that it would be extremely difficult and expensive to properly ventilate the workings by means of a single fan situated at the portal. This is true not only of No. 35 mine but of many others owned by this concern. But as this mine is one of the largest and oldest plants which the company now owns, it may be of interest to note what means have been taken to make certain that the men within the mine shall receive an abundant supply of fresh air.

The coal under development is the "B" or "Miller" bed, as it is called locally. Its thickness averages about 42 in. The problem that officials of this company were

confronted with can readily be appreciated. It is practically impossible to force a sufficient quantity of air through air courses that maintain only the height of this coal when the main haulage entries are approximately four miles in length. By installing a larger fan and taking down the roof for the full length of the air course to be traveled the situation could be met. But to do this would mean a large and unprofitable expenditure.

Several years ago this company decided to build a substation on the surface located over a point near the end of the main haulage entries. By sinking a shaft at this point and installing an exhaust fan it was possible to use the shaft for the upcast air currents, which were driven through the mine by a fan situated

FIG. 2.

Fan and Driving Motors

Two motors drive the fan alternately. The steady operation of the rope drive may be judged from this time exposure, which shows practically no blur about the farther rope, which is in rapid motion.

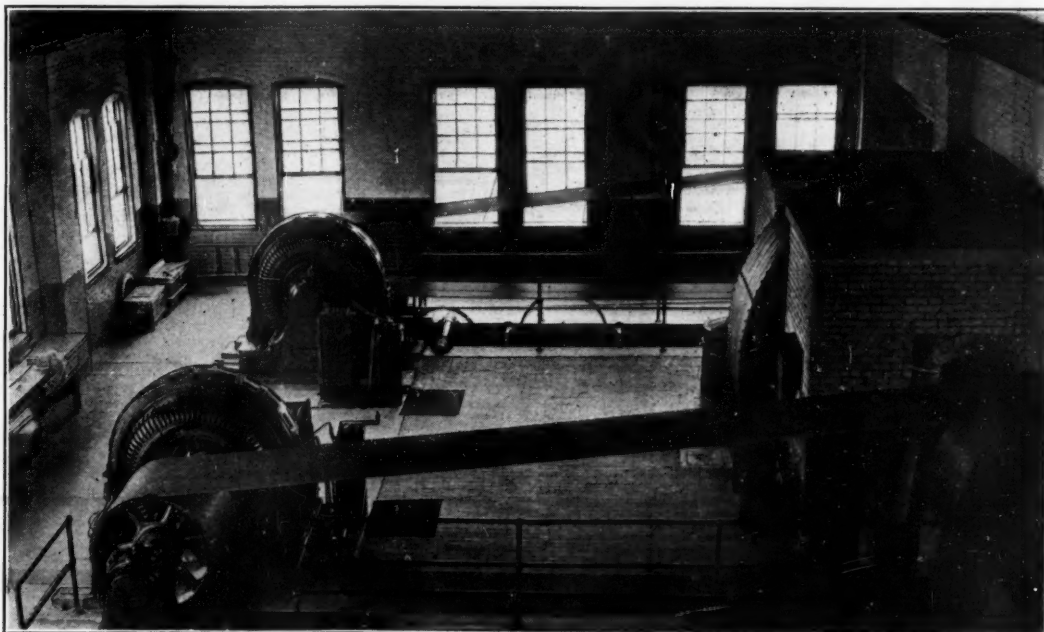
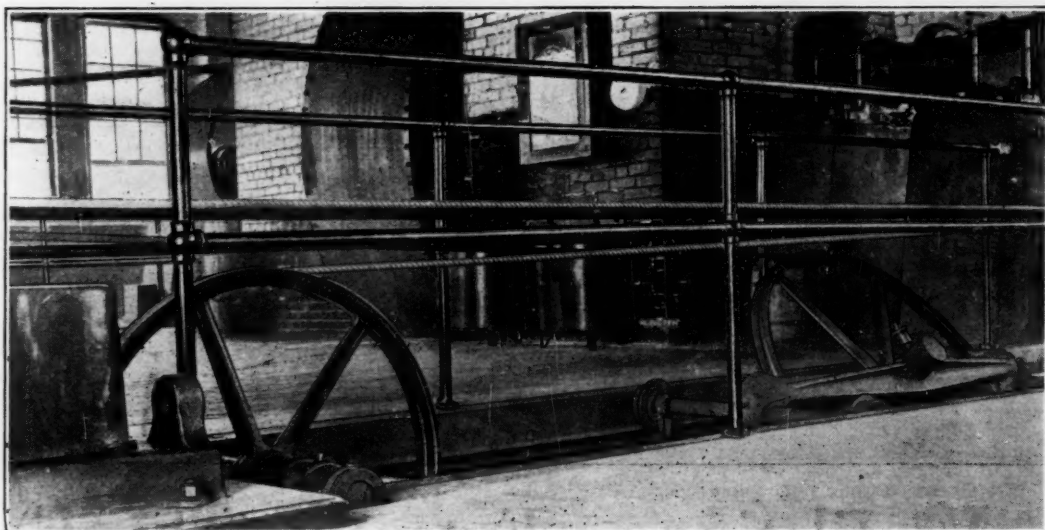


FIG. 3.

Idlers and Tension Carriage

Proper tension on the rope is maintained by the tilted idler on the carriage, which moves back and forth under the action of the rope and an opposing spring.



at the drift mouth, which is located three miles away at the town of Windber.

In this manner a circulation was created that was more than sufficient to assure the miners of an abundance of fresh air. The substation therefore serves a double purpose—to aid ventilation and to generate current wherewith to re-energize the trolley wires at the far end of the mine.

SYSTEM SO SUCCESSFUL, OTHER MINES USE IT

The substation for No. 35 mine, which was the first to be constructed and which serves as a model for others of a similar nature and purpose, is located near the town of Elton on the South Fork Branch of the Pennsylvania R.R. The building is constructed of red brick with steel roof trusses. The equipment at the other substations of the company varies but little from that at No. 35 mine. The general type of construction

is similar but varies to a small degree. Some of these buildings are of native stone while others are of buff brick. The purposes of this article will be served by describing the substation at No. 35 mine.

One-half of the building is occupied by the fan and its driving units. Two 450-hp. Allis-Chalmers motors operating on a 6,600-volt current serve to drive the fan. Only one of these is needed at any one time, the other acting as a spare. When either machine is idle it is easy to clean it and place it in good condition for operation when its turn comes.

The fan, a 9 x 3-ft. Jeffrey ventilator, has a large driving pulley on either end of its shaft, or rather upon a shaft detachably connected to the fan shaft. As can be noticed in the illustrations, each motor is connected to its corresponding fan pulley by a rope drive. This drive from motor to fan pulley consists of twenty-two laps of tarred manilla rope. This type of drive is not

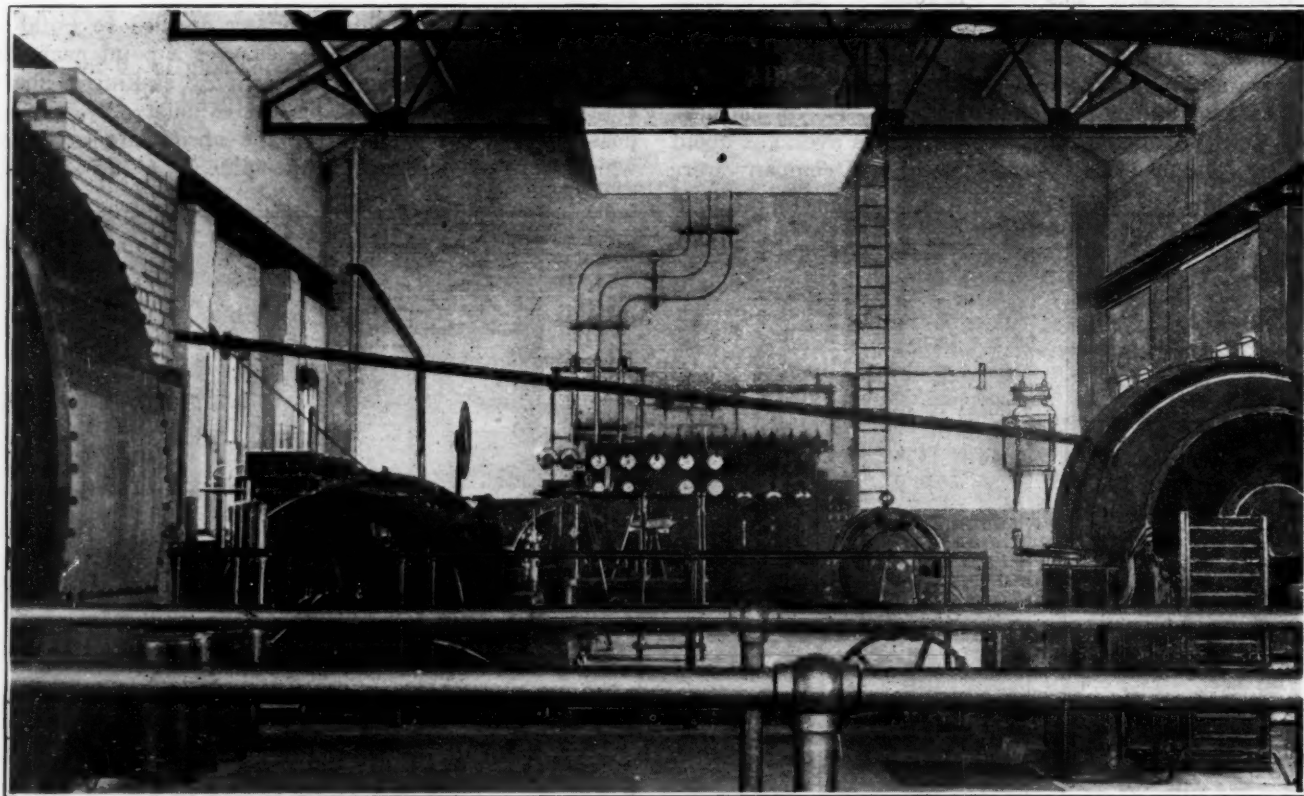


FIG. 4. HOIST AT THE OPPOSITE END OF THE SUBSTATION

Apparatus here installed includes a Vulcan hoist, two rotary converters and the necessary switchboard.



FIG. 5. LIGHT HEADFRAME OVER AIRSHAFT

This shaft serves not only as an air return but in time of need gives a means of entrance or egress to all portions of the mine when access or exit cannot be had via the main opening.

often encountered at American coal mines although it is quite usual at Berwind-White power plants.

The officials of the company speak most highly of the rope drive, regarding it not only as a type of installation lower in first-cost than any other but one to be favored because with it the transmission member can be kept taut at all times without resort to the common form of idler which is employed to depress the belt and thus take up the slack.

In Fig. 3 is shown a close-up view of the stationary and traveling sheave wheels that are used to absorb the slack in or regulate the tension on the belt. One lap of rope coming from the pulley on the fan shaft passes over a stationary wheel sunk in a concrete pit below the belt. From that point the rope is directed to a second idler of the same size. This wheel is mounted on two small trucks and, subject to the action of a spring, has a certain amount of travel on a track. When the motor is running this take-up has a continual yet not extensive movement back and forth.

This arrangement also permits of an easy and quick adjustment when it becomes necessary to install new rope. The substation has been in operation over two years, which means that each rope has been subjected to about one year of continuous service. There is no doubt that this is an economical type of installation, for the rope still shows no sign of wear and tear.

Leaving the traveling sheave, the rope returns to the motor-drive wheel, from which point it forms part of the belt proper until it again leaves the opposite side of the wheel after having made the necessary number of revolutions. The extent to which the belt is kept at proper tension at all times can well be appreciated from an examination of Fig. 2. The belt in the background was running when this photograph—a time exposure of 20 sec.—was taken, yet a clear outline is shown. Had there been appreciable play in the ropes a blur that

could be noticed would have appeared on the negative.

The generating equipment, which is placed on the side of the building opposite to that occupied by the exhaust fan, also is installed in duplicate. Here two 400-kw. Westinghouse rotary converters have been installed, only one of which is operated at a time. Three 150-kva. transformers are assigned to each converter.

At the time this substation was constructed the central power plants of the company were located at the No. 35 mine and at No. 40, which is about two miles north of No. 35. In undertaking to ventilate the workings by means of a secondary exhaust fan situated a considerable distance out in the country it was realized that no single high-tension line would form a sufficient guarantee against either the shutting off of power at the central station or the possibility of the line itself being temporarily put out of commission during a storm. A lack of power at the substation would, of course, mean the closing of the mine immediately, as the fan would not be in operation.

Furthermore, as already stated, it was desirable that new energy be fed into the trolley lines. Hence it was imperative that the direct-current generator be kept in operation at all times. As an additional safeguard and in order that high-voltage alternating current might be available continuously, two separate high-tension lines were run to the building. One of these comes from the central power plant of the No. 35 mine at Windber and the other from the generating units of No. 40 mine. Both these lines have been constructed so that either is available to all similar substations at this company's operations.

In case of trouble at No. 35 power plant or on any part of the line itself the line from the plant of No. 40 mine, already connected to the exterior of the building, is at once available. In this case a second set of transformers step the current down for use in the electrical machines. The motors driving the fan are fed over the same lines regardless of the origin of the current.

The shaft in the rear of the building is of the two-compartment type and has been sunk 650 ft. to the coal. One compartment is used for the upcast air current, while the other serves as a manway. A small compartment adjacent to the manway is utilized for the suspension of the feed lines that reach from the building to the outer sections of the mine.

This shaft, situated where it is, provides two ways, each at opposite ends of the mine, for entering or leaving the workings in time of accident. Thus the state law has been admirably complied with. A 75-hp. Vulcan electric hoist engine operating on 550-volt direct current is situated in the substation and is used in raising or lowering the single cage that the shaft contains. This engine winds a 1-in. cable on a 7-ft. drum. A low steel headframe completes the construction.

The substation just described is typical of the construction followed in all the mine buildings at the different operations of the Berwind-White Co. The securing of adequate ventilation of the mines is but one of many problems that operators in the thin beds have to contend with which do not confront those whose good fortune it is to operate thicker beds. Another problem is in the type and construction of mine cars and locomotives. But these are somewhat balanced by the fact that these mines are practically non-gaseous, and safety measures that must be enforced rigidly in many other districts are here unnecessary.

Safe Ways of Using Alternating Current For Coal-Cutting Machinery*

Electric Mining Machine Has Increased Safety in Mining—Five Methods of Conducting Current Arranged in Order of Safety — How Transformers Should Be Protected — A 230-Volt Alternating Current Recommended

BY L. C. ILSLEY† AND E. J. GLEIM‡

THE U. S. Bureau of Mines recently completed an investigation in the Henryetta coal fields of Oklahoma, where several deaths had been attributed to the use of electricity. The recommendations made as a result of this investigation have a bearing on the use of alternating current in connection with coal-cutting equipment and are set forth below.

It is the firm belief of the bureau's engineers that the introduction of electrical mining machines, considered in a broad way, has done much to increase safety in mining. There can be no doubt that the substitution of machine mining together with permissible powder for the method of "shooting from the solid" has been the means of saving the lives of many shotfirers. Machine mining also leaves the roof in a better condition, as lighter charges of powder are required to bring down the coal. Thus the danger from falls of roof is lessened.

It is recognized that every effort should be made to prevent all accidents due to the use of electrical machinery, but it is felt that any action tending to limit the use of such machinery would be a backward rather than a forward step in the safety measures laid out to decrease the hazards in coal mining.

MACHINES NEED BETTER CABLE-REEL EQUIPMENT

It is recommended that steps be taken to interest the various manufacturers of coal-cutting equipment in the design of a cable reel adapted to meet the conditions found in mining thin seams.

A cable reel should be developed which will reel up and pay out the cable properly and so reduce to a minimum the destruction of the insulation. This reel should be mounted on a truck such as will give the machine runner freedom to exercise full control over his machine, especially when running from place to place. The reel-truck design should be such that there will be no interference between the reel and the roof during the loading or unloading of the machine from the power truck.

Switches or plugs should be incorporated in the design of the reel or its truck so that in case the insulation breaks down in either the machine or the cable connecting it with the reel and causes the machine or some of its parts to become charged, the danger can be

quickly eliminated by the opening of the switch or plug.

Machine runners or helpers should immediately report defective cables, which should be taken to the surface and thoroughly dried out before repairs are made on them. An extra cable in good condition should be kept in reserve to replace one that is taken out for repairs.

The cable should so enter the frame of the machine as to reduce abrasion and short bends to a minimum. The clamp which takes the strain of the cable should be made of heavy insulating material. The axis of such clamp should preferably be parallel to the longitudinal axis of the machine, so that there will be no short bend in the cable

at the clamp when the cable trails behind the machine.

The attachments by which a cable is connected to the power circuit should make firm contact with the lines, but it should be possible to detach the lines by a strong pull on the cable whenever it may be desirable to disconnect the circuit from a distance without traveling the entire length of the cable to the point of connection.

SAFETY IN INSTALLATION OF FEEDER CIRCUIT

It is recommended that great care be exercised and that special attention be given to safety requirements in the installation of machine-feeder circuits along traveling ways. Five different systems of installation may be employed, as suggested below. A number of factors may affect the decision as to the system best suited to meet the individual and special needs of each mine. The methods suggested, however, are given in the order of their safety.

(1) Use lead-sheathed cable armored with steel wire or steel tape and bury it along the rib or support either on the rib or props. Connections to mining machines can be made at suitable junction boxes placed at convenient intervals.

(2) Use rubber-covered wire installed in an iron conduit with junction boxes at convenient intervals. The joints in the conduit should be leaded or otherwise made watertight and the conduit should be so supported as to drain off any moisture that might collect on it. The conduit should be well grounded.

(3) Run separate wires through the gob on the side of the entry, installing them on the roof back of the timbers or props. Such wires should be protected by a narrow board hung on edge from iron hooks wedged in drillholes in the roof.

Cable reels need improvement. Too prone to injury and being not readily disconnected by the opening of a switch or plug, they introduce dangers that better construction might avoid. Injured cables always should be taken to the surface and dried before repairing. Conductors should be of adequate size, having regard both to duty and length.

*Article entitled "Safe Use of Alternating-Current Type of Coal-Cutting Equipment" published in U. S. Bureau of Mines' Reports of Investigations.

†Electrical engineer, U. S. Bureau of Mines.

‡Assistant electrical engineer, U. S. Bureau of Mines.

(4) Use separate wires installed on the edge of the timbers facing the gob. Such lines always should be completely protected by boards, so as to prevent accidental contact.

(5) Use unguarded circuits, either of bare or insulated wire. Such circuits should be placed sufficiently high or far enough to one side of the road or traveling way to eliminate the possibility of accidental contact. Rubber or weatherproof insulation should not be considered as a protection against electric shock.

Armored cables and conduits may be supported by iron hooks attached to the timbers, the roof or the side of an entry. Where separate conductors are used in place of armored cables or conduits they should be supported on porcelain insulators placed at sufficient intervals to keep the lines away from timbers, coal and slate, and from each other.

LARGER CONDUCTORS FOR LENGTHY CIRCUITS

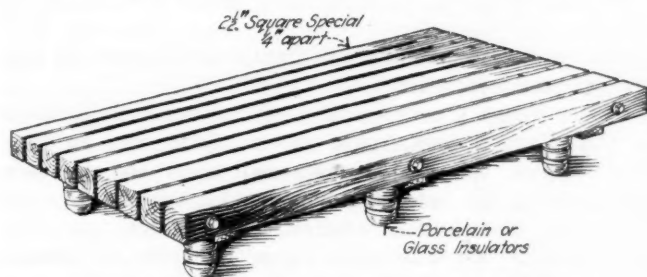
For 440-volt circuits the minimum size of wire that should be used is No. 4 Brown & Sharpe gage. In case the length of the circuit is in excess of 2,000 ft. or if more than two machines are connected to the circuits the size of conductors should be increased proportionately. For 220-volt circuits the minimum size of the wire that should be used is No. 1 B. & S. gage. In case the length of the circuit is in excess of 2,000 ft. or more than two machines are connected to the circuit the size of conductors should be increased proportionately.

Platform of Shellacked Oak on Glass Legs Safely Insulates Worker

Elkhorn Coal Corporation Employs Device for Electrical Workers That Is Effective and Less Expensive Than a Rubber Mat

By G. E. DAUGHERTY
Pikeville, Ky.

SOME form of insulator between a person working at a switchboard or other piece of electrical equipment and the floor of the power house or substation is a necessity if the necessities for safety are to be scrupulously observed. The most common form of such



COMPLETED OAK INSULATING PLATFORM

insulation is the rubber mat. This, while neat and usually effective, has the disadvantage of being somewhat expensive.

The Elkhorn Coal Corporation, in its substations and power houses, employs an insulated platform in front of switchboards and other electrical devices which consists of oak strips $2\frac{1}{2}$ in. square placed $\frac{1}{4}$ in. apart, fastened to transverse cleats and the whole treated with shellac. Such platforms are made 2 ft. wide and from 4 to 8 ft. long. They are supported by porcelain

The following recommendations are made with respect to transformer installations:

(1) If transformers are so located as to prevent any hazard due to accidental contact they should be placed in a locked enclosure. (2) Lightning protection and disconnecting switches should be provided on the high-voltage or incoming side of all transformers. (3) The casings of all transformers should be provided with a ground connection separate from that provided for the lightning arresters. (4) Transformers connected in delta or open delta should not have their secondaries grounded.

Switches should be supplied for each branch machine circuit and whenever possible located in a thoroughly dry place. In case the switches cannot be so located an insulated platform should be provided on which the operative will stand when operating the switch.

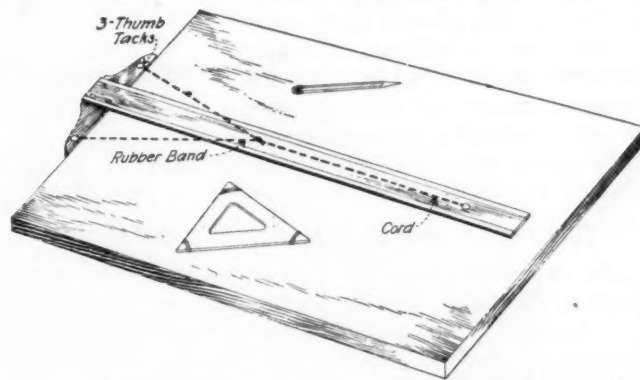
It is suggested, in the interest of safety, that new installations use, in so far as is practicable, nominal potentials of 230 volts for alternating current and 250 volts for direct current in the operation of coal-cutting and other portable equipment.

It is believed that thorough first-aid training, including resuscitation from electric shock, would be a great asset to the men in and about the mines. A chart explaining and illustrating the method commonly used in resuscitation, such as is issued by the Bureau of Mines, should be posted in a conspicuous place at all mines.

or glass legs usually 4 in. high. These insulated platforms form a safe footing for men when working at switchboards or upon other electrical devices or machinery.

Rubber Bands as Draftsman's Aids*

THE common rubber band is one of the handiest of a draftsman's accessories. A small band wound around pencils, penholders, etc., will keep them from rolling off the board, and save many a broken point. Three such bands wound around the corners of a



METHODS OF USING RUBBER BANDS

triangle,¹ notches having been cut in the wood to hold them from slipping, will raise the triangle above the surface of a tracing and reduce risk of smudging.

A larger band or two, and a piece of cord serve to hold the head of the T-square always in contact with the edge of the drawing board, the device being attached to the under side of the square and board by tacks.

*Henry H. Moore in the *American Machinist*.

¹A triangle with raised corners would be so much preferable that it is difficult to believe that it has not already been placed on the market.—EDITOR.

Drying Coke-Oven Coal Centrifugally in One Continuous Automatic Operation

Drying Washed Coal by Draining Is Slow and the Capacity of the Batch Centrifugal Is Small—A Centrifugal Drier with Continuous Feed and a Practically Continuous Discharge Affords Ample Capacity and Gives Desired Results

BY CARL WENDELL
New York City

CENTRIFUGAL drying of materials is by no means new. It has been practiced for many years, but until recently the machines used have been what were known as "batch" driers. With them it was necessary to charge the container, whirl it for a certain length of time, then stop it and unload. This type of device is quite effective where a large capacity is not required.

In recent years it has become necessary in large coking plants to prepare the coal for the carbonization process by washing out the foreign material. After this process is complete, the coal, of course, contains such a quantity of water as is destructive to the walls of the coke ovens in which it is charged. The problem then arises as to the manner in which the coal may be rid of this excessive moisture. Two distinct methods naturally suggest themselves, namely, removal in bins by gravity drainage and removal by centrifugal force in a drier.

Bins adequate to provide gravity drainage must be of large capacity. A 3,000-ton washery will require bins holding 6,000 tons of coal where the time allowed for drying is twenty-four hours. The cost in many cases is, therefore, prohibitive. Drying bins should be unloaded from the top, and the machinery for this operation, a power crane and a conveyor system, entails heavy expenditures both at the time of its installation and throughout the operation of the plant.

CAPACITY OF BATCH MACHINE IS TOO LOW

Coke ovens and washery operations naturally turn, therefore, to the more rapid and effective centrifugal drier, for the batch method with its low capacity per machine requires too many units. Before the centrifugal method of drying was introduced it was necessary, however, to devise the machinery for that purpose, as none was available.

Experimental machines were accordingly constructed. The first of these consisted essentially of a cone into which the coal to be dried was introduced and allowed to slide along the conical surface under centrifugal action until it was discharged. It was necessary in this device to have large scrapers or plows within the cone in order to insure the discharge of the fine material.

As, however, there was no method of controlling the

time during which the material was held in the machine, and as the action of the scrapers or plows was highly destructive to the screen surface, it became evident that a device that would provide a time control and eliminate the scrapers would be highly advantageous, both from the standpoint of maintenance and of power

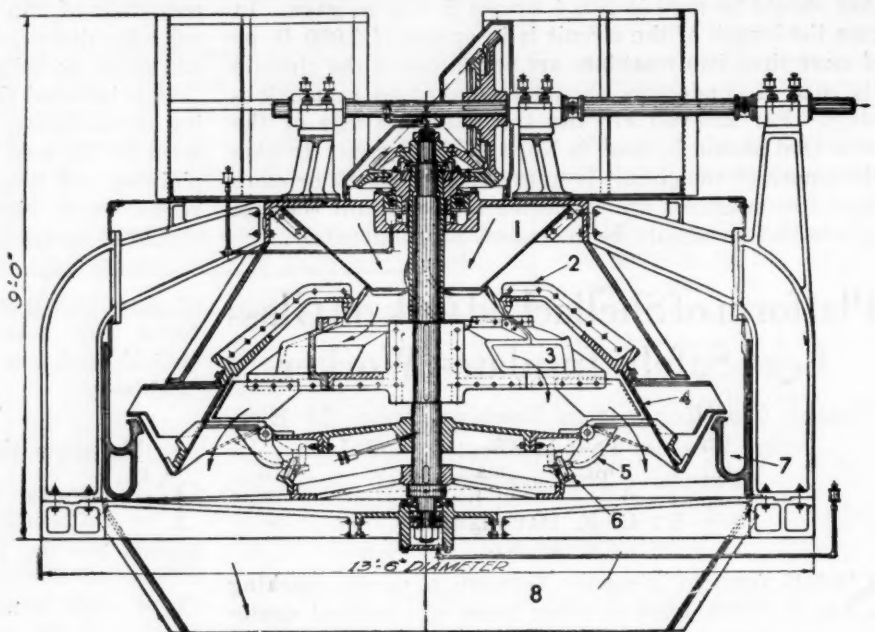


FIG. 1. CROSS-SECTION OF WENDELL CENTRIFUGAL DRIER

Essentially this machine consists of a cone-shaped screen compartment the floor of which is provided with a series of gates periodically opened by means of cams. The feed is continuous and the discharge intermittent.

consumption. A machine was finally developed with the desired characteristics.

Fig. 1 shows a cross-section of this machine, known as the Wendell centrifugal drier. Referring to this cross-section, the coal is received from the jigs or conveyors in the receiving hopper (1). It then passes into two distributing chutes (3), which are set diametrically opposite each other in order to secure balance. These distributing chutes throw the coal against the conical screen (4) and over a gate (5) which has just been opened and closed by means of the cam (6). These cams rotate at the same speed as the distributing chute (3).

The distributing chutes and the cam are carried on a shaft which rotates faster than the centrifuge or container (2). This shaft is mounted on a sleeve and is driven by the larger bevel gear, while the shaft is driven by a gear that is slightly smaller. The usual speeds on the 8-ft. machines are 250 r.p.m. for the container and 250.89 to 252 r.p.m. for the cam and

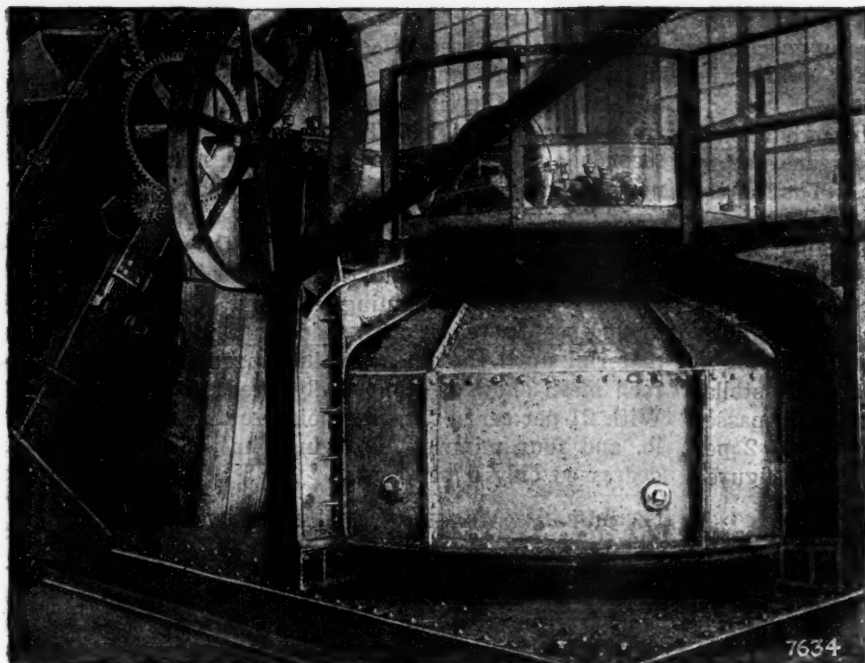


FIG. 2. CENTRIFUGAL DRIER AT THE COKE PLANT OF THE STAG CANON FUEL CO., DAWSON, N. M.

This drier, which, as may be seen, is belt-driven, has been in successful operation at the above plant for some time.

distributing chutes, the revolutions of the latter being fixed by the time during which it is desired to hold the coal in the machine.

After being whirled a suitable length of time two gates open, one opposite the other, and the coal drops into the hopper (8). The water passes through the screen to the sluice (7) and is carried away. The machine is continuous in its action, the discharge, however, being slightly intermittent. It is necessary to hold the material within the machine for a certain length of time, and this is fixed by the time the cam takes to pass from one gate to the next. The relative movement between the screen and cam is only about one or two revolutions per minute, and the wear is, therefore, reduced to a minimum. The slope of the screen surfaces is made small, being, however, sufficient to allow the fine material to flow over it easily.

At the coke plant of the Colorado Fuel & Iron Co. are installed and in operation five of these machines. Three of them are of large size. They operate sixteen hours per day and each handles fifty tons of coal per hour. Since certain improvements were made in the mechanical details of these machines they have dried 2,400 tons of coal per day to an average moisture-content of 7 per cent. The capacity of these centrifugal driers is, as stated above, fifty tons of coal per hour for the No. 8, or large, machine, and about twelve to fifteen tons per hour for the smaller machines. The power required to accelerate the larger machine is from 25 to 30 hp. With less power the acceleration to full speed would take too much time. This same machine uses only about

15 hp. when running at full speed.

The cost of drying coal with these machines ranges at present from 3c. to 4c. per ton. This figure includes power, maintenance, labor and depreciation.

The few paragraphs which follow are condensed from comments made by H. B. Carpenter, in charge of the coke ovens of the Colorado Fuel & Iron Co. As stated above, Mr. Carpenter is using five driers. His comments, based on a careful record of the results of operation, will give an idea of the work they are doing.

"The byproduct-coke plant of the Colorado Fuel & Iron Co. consists of 120 Koppers coke ovens, complete with byproduct and benzol recovery plants. The coals used for coking contain such a high percentage of ash that they must be washed before a satisfactory grade of coke can be produced. This washing process results in the washed product carrying with it an excessive amount of moisture, unless efficient methods are employed for its elimination. The drying of the coal is one

of the most difficult problems encountered, chiefly because of the fine crushing necessary to secure highly efficient washing.

DRAIN THE COAL IN A DRAINAGE CONVEYOR

"The washed coal from the jigs is discharged to a drainage conveyor along with the fines or slush from the settling cones. In this conveyor a large part of the moisture is drained from the coal, so that the material enters the driers with a water-content of about 12 per cent. It is highly important that this coal should carry as low a percentage of water as possible, as the amount of moisture in the resultant dried coal is

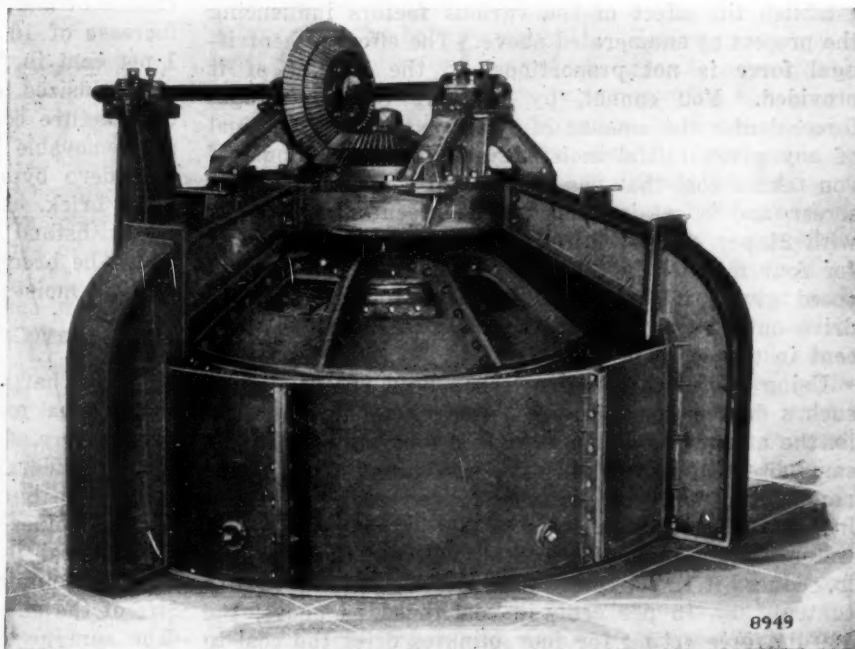


FIG. 3. A NO. 8 DRIER WITH SOME OF THE HEAD WORKS REMOVED

Two sets of bevel gears are plainly visible. These drive the centrifuge and cams at slightly different speeds, thus permitting continuous feed and intermittent discharge.

strongly affected thereby. Aside from mechanical difficulties, no trouble has been encountered in our machines in securing a product sufficiently dry for coking in byproduct ovens.

"The average fines, or coal passing through a one-eighth inch mesh, are sent to the sludge screens, where most of the water is removed from it. The partly dried product then goes to the drainage conveyor with the washed coal. We have experienced no difficulty in drying this fine material. With some types of machines trouble is encountered from the large amount of fines produced by the machines themselves. Practically no fines are made by the Wendell driers, and I attribute, in large measure at least, the success of our installation to this fact. The amount of fine coal that passes through the screens of the driers is only about 2 per cent of the total fed to the machines (coal figured on a dry basis).

"The design of the machines employed enables us to secure a life of approximately 150,000 tons of coal per screen, making the cost of renewal so small as to be almost negligible. Concerning the cost of drying coal by this method, in our practice it does not exceed 4c. per ton, and, by improvement in design, it can be reduced to 3c. per ton. This cost includes labor, power, maintenance, etc."

WATER MORE EASILY REMOVED AT FIRST

The drying of coal by centrifugal machines is simply accelerated drainage. The important features to be considered are centrifugal force, the time during which this force acts upon the mass of coal, the size of the coal, the amount of fines, the initial moisture in the coal and the mass of coal on which the force is applied. In considering these items the initial moisture and percentage of fines are the most important, other conditions remaining equal, but the effect of these factors is not always the same in magnitude throughout the entire range of variation.

I have made tests to determine the extent to which washed coal may be dried by centrifugal action, and to establish the effect of the various factors influencing the process as enumerated above. The effect of centrifugal force is not proportional to the amount of it provided. You cannot, by doubling the centrifugal force, double the amount of water extracted from coal of any given initial moisture and fineness. Thus, if you take a coal that passes through a one-eighth inch screen and is retained on a one-sixteenth inch screen with 21 per cent of initial moisture and you whirl it for four minutes in the centrifugal drier running at a speed giving a centrifugal force of 100 lb. you will drive out 12 per cent of the moisture, leaving 9 per cent in the coal.

Using the machine after it has been speeded up to such a degree as to provide a centrifugal force of 300 lb. the amount of water left after four minutes in the same size coal having the same percentage of moisture, namely, 21 per cent, will be 4½ per cent. Thus an increase in centrifugal force of 200 lb. has reduced the water content only 4½ per cent, whereas the first 100 lb. reduced it 12 per cent. With a lower initial moisture content, say 15 per cent, in coal dried as above, the 100 lb. force acting for four minutes dries the coal to 4.7 per cent, while 200 lb. additional force would remove only 1.5 per cent of additional moisture.

Increasing the time of whirling or the interval during

which the force acts on the coal has the same declining effect as an increase in centrifugal force, but with low initial moisture and low centrifugal force the effect of increasing the time from fifteen to thirty seconds is frequently negligible. The difference between thirty seconds and two to four minutes is much more pronounced in all cases. An increase from fifteen to thirty seconds rarely accounts for a decrease of more than 1 per cent in moisture content, while the period of four minutes causes a loss four times as great.

Other factors remaining constant, the difficulty in drying coal increases with a decrease in the size of the material until the fines passing through one-sixteenth inch mesh show an abnormally great retentive power. With 21 per cent of initial moisture and a force of 300 lb. and four minutes of drying time, the moisture is decreased only 5 per cent.

DRAINS WATER AS IF ITS GRAVITY WERE 80

With the Wendell centrifugals, which are manufactured by the Link-Belt Co., of Chicago, the drying time is from 7½ to 15 seconds. This can be raised to 30 seconds if desired. Some of these machines operate with a time of 7½ seconds and others on a time of 15 seconds. The duration of drying may be controlled to suit operating conditions. The effective radius of the machines is 3.75 ft. With a speed of 250 (± 5) the centrifugal force obtained amounts to 79.9 (± 3.3) lb. The acceleration in these machines is, therefore, practically eighty times that of gravity.

A summary of my experience in coal drying by means of centrifugal machines is about as follows:

1. The amount of moisture remaining in the coal (excluding, of course, in the calculation the moisture not removable by air drying) decreases with increase of centrifugal force, with an increase in the time of whirling, with a reduction in the thickness of coal on the screen, with a decrease in initial moisture and with a decrease in the percentage of fines. This holds true for all ranges that I have investigated.

2. A variation of 10 lb. in force accounts for a change of less than ½ per cent in final moisture, and an increase of 10 per cent in fines means an increase of 1 per cent in final moisture.

3. Unsized mixed coal has been dried to 2.8 per cent of moisture content (excluding here also all moisture not removable by air drying).

Modern byproduct coke ovens are often lined with silica brick. It is well known that this material cannot withstand sudden cooling and contraction such as would be brought about by contact with a coal charge high in moisture.

DRY COAL DOUBLES LIFE OF COKE OVEN

When charged into coke ovens washed coal drained in the usual manner contains approximately 10 per cent of moisture. Such a charge either delays the coking time considerably, or if a short coking time is sought, causes the burning of an excessive amount of gas in the oven flues in order to drive out the excess water. Where coal is charged into an oven still dripping—that is, containing 10 to 12 per cent of moisture—the life of the entire battery is reduced about 50 per cent. The sum necessary to equip a washery with centrifugal driers is, therefore, small, and almost negligible compared with the saving that may be gained by this improvement.

Comparison of Combination and Cable-Reel Locomotives as Gathering Units*

Cutting Off the Cable and the Arcs Formed When Nipping the Trolley Wire Are Counts Alleged Against the Cable-Reel Locomotive—Less Work Is Demanded of Motorman and the Bonding of Room Tracks Is Not Needed with Combination Machines

BY JOHN B. HICKS
Jenkins, Ky.

IN THE handling of combination storage-battery and trolley locomotives, as in operation of locomotives driven by storage batteries only, the main problem is to take due care of the accumulator.

The storage battery requires regular and systematic attention. It may be compared to a mule so far as the treatment necessary to keep it in good working condition is concerned. The mule cannot be fed spasmodically and continue to give satisfactory service; nor can the storage battery be charged irregularly and prove a success. The result of neglect in either case is a failure in performance.

The employment of motormen in the mines where the reel-and-cable and the combination locomotives have both been used has afforded the following experience: Where it has been necessary temporarily to transfer a motorman from a cable-and-reel to a combination machine he invariably has quit or taken a job of coupling after the battery locomotive in order to be in line for promotion at its first vacancy to motorman on the locomotive of combination type.

CABLE REELS FREQUENTLY CUT BY LOCOMOTIVE

In operating the reel-and-cable locomotive the motorman has to take care of both the cable and reel. No matter how carefully this may be done the cable is frequently run over and cut, causing a delay while it is being spliced and insulated. All operators know what delays mean to production. Furthermore, either the transfer switch must be operated twice at each room in order to shift the power to the reel and then back to the trolley circuit, or the motorman must "nip" along the trolley wire from room to room until the trip is gathered. The arcing caused by this "nipping" is hard on the eyes.

When gathering, the trolley pole on the reel-and-cable locomotive must be buckled down, as on the machines of the combination type. On locomotives of this type, however, there is no cable to guard, no transfer switch, and nipping is impossible. The shift from

battery to trolley or vice versa is made on the reverse cylinder of the controller. It may thus be readily seen that the work of a motorman is much easier on the combination than on the reel-and-cable locomotive. The objections of the motormen were eliminated by exclusively equipping some of the mines with reel-and-cable locomotives and others with all combination battery-and-trolley machines.

In comparing the expense entailed in the operation and maintenance of these two types of locomotives the cost of labor for operation as well as that of repairs to the equipment must be considered. The labor costs for operating are about

In three years over three million tons of coal have been gathered at the Elkton mines of the Consolidation Coal Co. at a charge of under one cent per ton, the gathering being done by combination locomotives. Battery costs each month are about equal to the cost of the feed and the depreciation of one mule, while each locomotive saves enough to pay the feed and depreciation costs of two mules.

the same for the two types of machines, as all motormen are paid the same rate per hour.

The maintenance of the reel and cable, including the cost of new cables, repairs to the reel and the motor which drives it, taken over a period of time equal to the life of the battery, will be found to equal if not to exceed the first cost of the accumulator. Our records show that the reel-and-cable locomotives are subject to more delays than the battery machines. Seldom do we see a battery locomotive come out of the mines because trouble has developed in the battery during working hours. On the other hand, it is not uncommon to see a reel-and-cable locomotive come out for repair of the cable or reel because of injuries sustained during the shift.

Commutators on reel-and-cable locomotives must be turned down oftener than those on battery locomotives. This is because of the commutators being burned by nipping along on the trolley wire. Controllers are much harder to keep in repair on reel-and-cable locomotives than on the combination machines. This also holds true for the other parts of the mechanism. Unless a double-conductor cable is used room tracks must be bonded where reel-and-cable locomotives are operated. It is not necessary to bond room track for the battery locomotive. This obviates the expense incurred in the installation and maintenance of bonds.

On comparing the storage battery with the mule, it is found that each accumulator locomotive replaces one man and three mules. This, however, does not save the full wages of one driver, for drivers are not paid as much as motormen and brakemen. The saving in wages will a little more than cover the cost of the current used in charging the battery, in fact, in addition, it will keep the battery in repair.

*Third installment of an article entitled "Use of Combination Battery and Trolley Mine Locomotives" read before the Kentucky Mining Institute at Lexington, Ky., June 4, 1920. The prior installments, entitled "Changes That Experience Has Dictated in Details of Combination Locomotives" and "How to Operate Combination Storage-Battery and Trolley Locomotives," appeared in the issues of July 1 and July 8 respectively.

†Assistant superintendent, power and mechanical department, Consolidation Coal Co.

Records show that the feed, shoeing, harness and depreciation of one mule exceeds by a small amount the upkeep and depreciation on one battery of the size employed. It must be remembered, however, that these are small-capacity batteries.

In other words, the battery costs each month of its life just about the same as the feed and depreciation of one mule. This leaves a saving equivalent to the feed and depreciation upon two mules for each locomotive in use.

From the mine operator's standpoint the leading qualification of a battery is ruggedness. It should be assembled in the locomotive in such a manner as to withstand the knocks and bumps incident to mine service. Barring accidents the satisfactory battery should not have to be removed from its containing compartments during its life, provided proper care is exercised. Such a battery has a low maintenance cost.

In the first batteries employed it was found that the rubber jars and trays were somewhat too light for the work required of them. The battery manufacturers have overcome this by designing the trays of sufficient strength and by increasing the thickness of the walls of the rubber jars. The jars were further improved by the use of a more flexible and a tougher compound. The most marked improvement, however, is the cell cover of latest design. The new cover fits flush with the top of the jar, thus leaving no space for the collection of dirt and moisture.

The locomotive manufacturers have made great improvement in charging equipment and in the methods of battery control. It is now possible to purchase locomotives that are so designed as to insure the greatest battery efficiency.

There is no question about the success of the battery locomotive under most mining conditions, which conditions should be invariably considered in making the selection of a locomotive.

One can safely say that at most mines a battery locomotive will gather and deliver coal to the parting or side track quicker and cheaper than either mules or a reel-and-cable machine. Where the coal has to be hauled a long distance after it is gathered, the combination battery-and-trolley locomotives are in general well adapted to this service.

After the coal has been gathered to the side tracks or partings, the question might arise as to the best method of delivery to the tippie or shaft. This problem must be worked out for each individual case, keeping the local mining conditions in mind.

The storage-battery locomotive has its own field. It is hardly possible that it will ever compete with the trolley machine on long main-line hauls or where the grades are steep over long distances.

I am convinced from experience, however, that before a storage-battery locomotive is purchased a complete survey should be made of the mine by a competent engineer, in order to ascertain whether the accumulator can be successfully used in the mine; if so, to fix its weight, type and whether a straight storage-battery or a combination battery-and-trolley machine is best adapted to the needs encountered.

The following figures on operation cover only renewals and daily care of batteries (which also includes the flushing as well as all necessary repairs made to the battery).

Over a period of three years some 3,002,361 tons of

coal were hauled at a cost of 0.96c. per ton. These figures do not give the battery credit for the recovery of rails in pillar work, the hauling of supplies, or the bailing of water with these locomotives. They cover only the actual coal tonnage handled.

My belief, under conditions as I see them today and with the close association that I have had in several recent years in this business, is that in a majority of instances the proper co-operation does not exist between the operator and the manufacturer of locomotive equipment. It seems to me that far better results are to be obtained if the operator will take more of the initiative than has been the rule. He should be able to a greater extent to work out his own problems, for from experience he knows what kind of equipment he should have with his locomotive. If necessary, he should, with the help of some one properly qualified by a knowledge of the details of mine-haulage problems, prepare information for the locomotive manufacturer. He should not leave to the manufacturer the burden of deciding on equipment, for it may not work out satisfactorily under some conditions that must be met in his mine. In order to obtain the best results from gathering equipment, I submit the following suggestions:

1. Be absolutely sure before installing storage-battery locomotives that operating conditions are suitable to their use.

2. Be sure to select a locomotive built to stand the rough usage that it is bound to receive in mining operations. It should be rugged in construction but simple and easy of operation, and so built as to afford ready access to all working parts.

3. In figuring the battery capacity, it should be assumed that a certain daily cycle must be fulfilled by the locomotive. In addition to this such extra capacity should be specified as will afford an adequate safety margin.

4. After having installed a locomotive, regardless of how good a machine it may be, it will not work satisfactorily unless proper care and attention are given it daily.

In closing I would say that I am firmly convinced that the storage-battery locomotive will fail only under three conditions: (1) lack of adequate battery capacity; (2) misapplication; (3) lack of attention.

One Exchange Urged for Hampton Roads

THOSE who are watching the situation closely at Tidewater seem to be very generally of the opinion that to bring out the handling of the maximum tonnage at the coal loading ports the pools must be operated as a unit. If the three pools at Hampton Roads were consolidated it is admitted that a much larger volume of business could be handled there.

It is suggested that some way should be found to induce the three roads to get together in the operation of a single pool. Such an arrangement, it is pointed out, not only would allow diversion of coal for a certain pool when there is congestion at one loading point but would allow a much quicker turn around for ships. Oftentimes ships are delayed because of lack of coal in one pool, which could be avoided if it were possible to allow a completion of cargo at one of the other loading points. Out of the present difficulty, it is believed, will come a clearer realization that one-man control must be established at each port such as was had during the war.

Precautions Taken to Protect Anthracite Breaker from Destruction by Fire

Hand Extinguishers, Fire Barrels, Two Sources of Water Supply and the City Fire-Fighting Force Adequately Defend Kingston Plant Against Fire Loss — Pump Building and Sheds Over Plugs Are Fireproof, Though Breaker, Being Old, Is of Wood

By DEVER C. ASHMEAD
Wilkes-Barre, Pa.

DANGER from fire, both on the surface and underground, continually confronts the anthracite coal operator. At the older plants this danger is much greater than at those that are modern because the less recent installations are built entirely of wood.

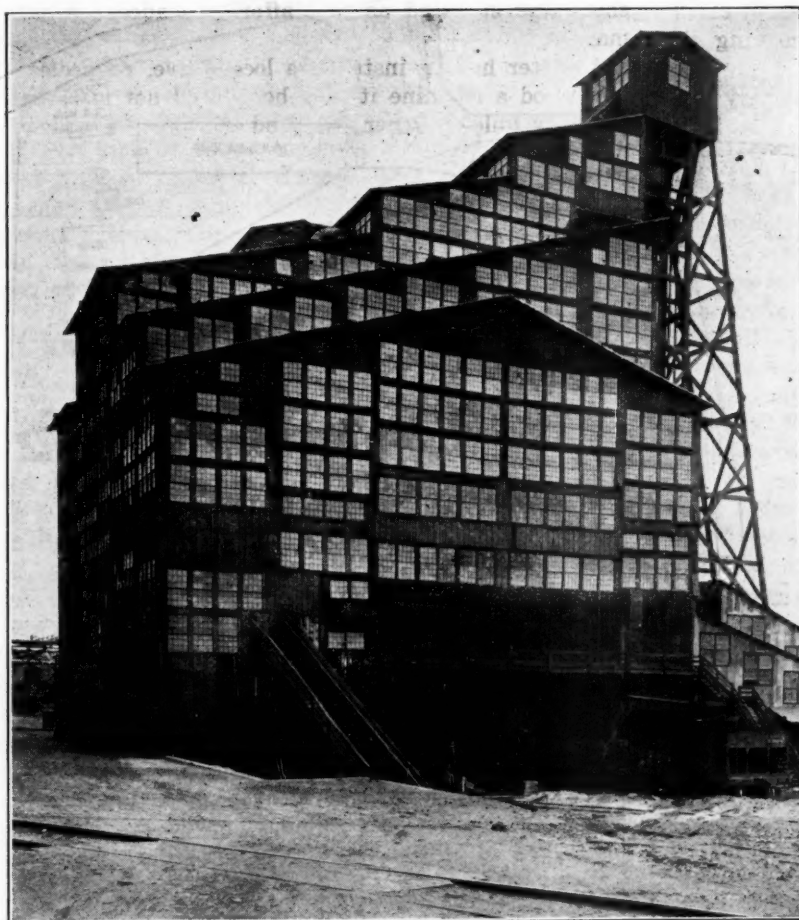
Probably one of the best systems of fire protection and fire fighting that have been devised is that now used at colliery No. 4 of the Kingston Coal Co., Kingston, Pa. A good system of fire protection is particularly necessary at this plant because of the large quantities of inflammable material used in its construction. This can be readily appreciated from the accompanying illustration of the breaker. The breaker itself is built entirely of wood, while in the construction of the older buildings still comprising the surface plant much of this material was used.

The Kingston company holds the record of having been one of the few coal producers which had its breaker take fire and yet, owing to its excellent fire protection,

was able to extinguish it before the building was completely consumed. The entire top of the structure was destroyed as was also the upper part of the headframe of the shaft. Nevertheless the fire was ultimately brought under control. If it had not been for the excellent fire-protection system that the company had installed at this point the entire breaker and headframe would have been consumed, shutting down the mine for months. As it was it was only necessary to cease operations for a little over two weeks.

The breaker at an anthracite colliery so far as fire hazard is concerned probably is the most vulnerable part of a mine as its partial or total destruction means the entire suspension of the operation until the breaker can be rebuilt. Consequently in the case of the fire above mentioned the expense that the Kingston Coal Co. incurred in the installation of the fire-fighting equipment was amply repaid.

The room in which the fire pump is located at colliery



No. 4 Breaker of the Kingston Coal Co.

This building is typical of many in the anthracite region. Built of inflammable material, destruction by fire is always to be feared. Its loss would be likely to cause a protracted shutdown of the entire mine. The charge of duly patrolling and protecting such a building seems large but it is only a modest sum compared with the cost that would be involved in its reconstruction.



No. 4 is situated at one end of the boiler plant. This pumproom is as near fireproof as it is possible to make it. The pump is of the duplex plunger type, 16 x 10 x 18 in. in size, and discharges its water to a 6-in. main. A man is in constant attendance in the pumproom so as to be ready for an emergency. The fire main delivers the water to seven fire plugs scattered about the surface plant and also to a standpipe in the breaker. The location of these fire plugs is shown in the accompanying plan and one is also visible in the photograph being just to the left of the extreme left-hand corner of the breaker. The plugs are placed in housings made from parts of old smokestacks. Each house has a sheet-iron roof and a steel door and contains 200 ft. of fire hose together with the necessary nozzles and spanners. These houses are painted a bright red to be easily distinguishable.

HAND EXTINGUISHERS LOCATED EVERYWHERE

In the breaker there are fourteen fire stations and attached to each plug is fifty feet of hose, with its nozzle. Besides the plugs fifty-seven barrels of water with two fire pails at each barrel are placed at points of vantage throughout the building. A still further protection is afforded by seven Johns-Manville extinguishers and fourteen Alert extinguishers of the soda-acid type. Where oil is used dry-chemical extinguishers are installed.

Throughout the breaker there are scattered eleven watchman's stations employing the Newman Clark

system. Every hour in the twenty-four the breaker is patrolled. The fire-fighting apparatus is inspected daily and at regular intervals the hose is tested.

All the engine rooms around the surface plant are furnished with Johns-Manville and Alert extinguishers. There are in the entire surface works, exclusive of the breaker, 14 Alert extinguishers and 24 Johns-Manville. All the oil houses and places where oil is used in quantity are equipped with some form of dry extinguisher and Pyrofoam. At the fire pump in the engine house there is 400 ft. of hose which can be connected to plugs immediately adjacent to the pump itself.

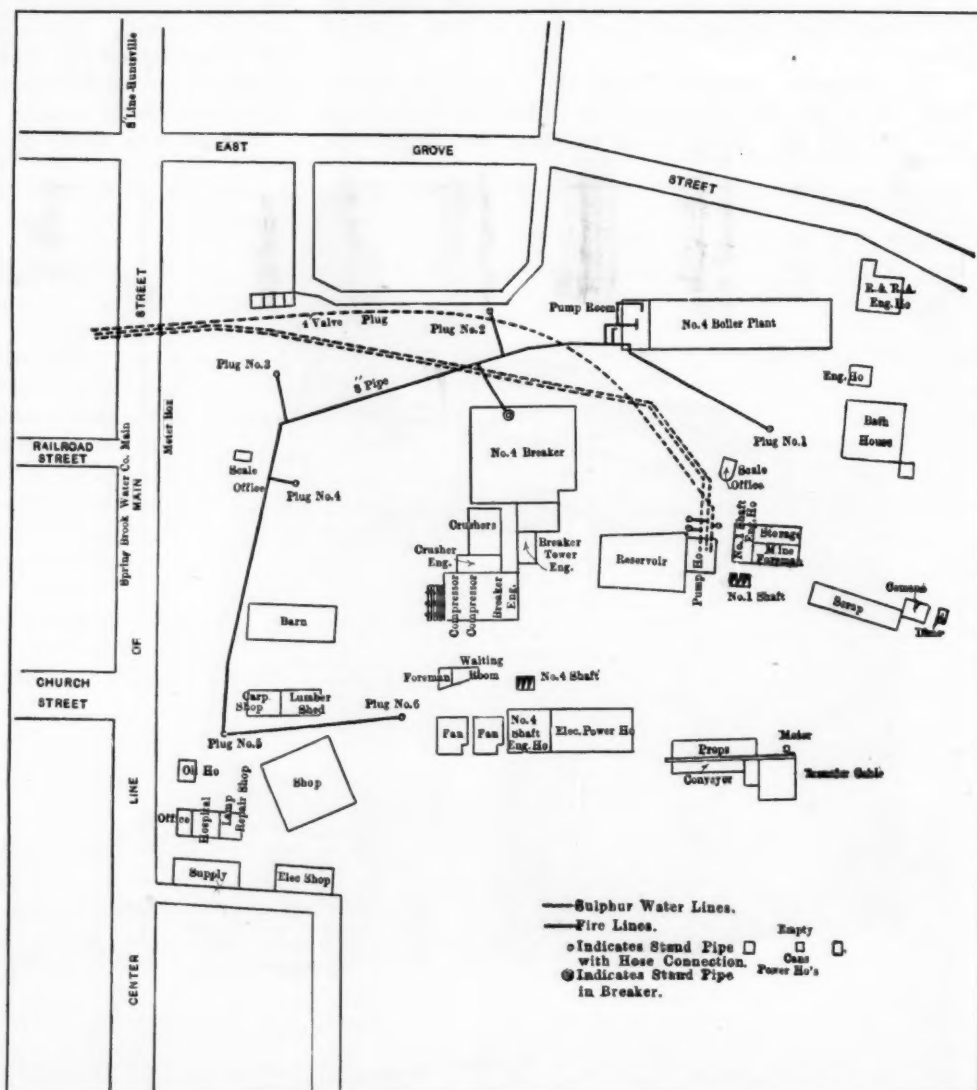
The preceding description covers the main fire-fighting system, but in case this should fail or be insufficient the company has installed an auxiliary system in connection with what are known as the sulphur-water lines. This sulphur water is pumped from the mine and is used in the breakers for the preparation of coal.

MINE WATER CAN BE PUMPED ON FIRE

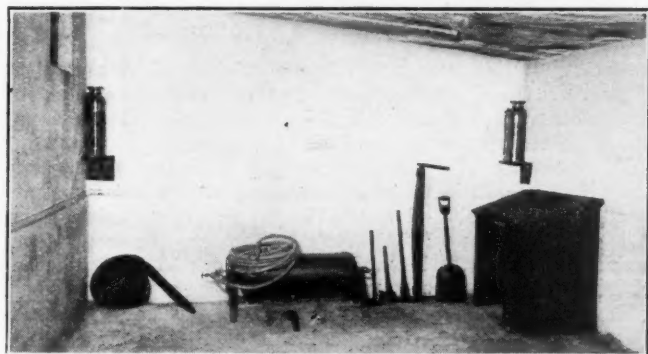
The mine water is delivered to a reservoir near the breaker and from this point is pumped to the breaker as needed. The pump used is of the duplex plunger type, 20 x 12 x 24 in. in size. Connections are so arranged that the breaker can be cut off and the hose can be connected direct to the pump, the water being used for fire fighting. Four hundred feet of hose is kept in this pump house for auxiliary fire-fighting purposes.

Plan of Fire Protection System

To protect No. 4 Breaker and the many buildings around it is an 8-in. water line and a reservoir of sulphur water the contents of which can be thrown in a flood onto the breaker from hose lines connected with a pump adjacent to the reservoir. With these conveniences a minute would not elapse before clean water would be playing in quantity on the flames, while in a short time those streams would be augmented by others fed by the water from the reservoir.



The whole surface plant is connected by an excellent telephone system with an operator who is in constant attendance. The exchange is located in the electric shop. In case of fire the telephone operator is called and the fire location given him. He then calls the boiler plant and an alarm is sounded on the main whistle. Each man is thoroughly instructed orally and by practice in what



AN UNDERGROUND FIRE HOUSE

Hose, chemical fire apparatus and tools are stored in a concrete-walled fireproof room.

he is expected to do in case of fire. Tests are made from time to time, the men continually striving to improve upon their previous records.

Besides fire protection already referred to, the company can secure assistance from the city. As one of the Kingston fire engines is stationed within a block of the coal company's plant this assistance is sure to be extremely valuable and timely. The company has in a test had a hose playing on a building in less than one minute from the sounding of the alarm, while the city fire department arrived in about 1½ minutes. The Kingston Coal Co. in the matter of fire protection, as in numerous other affairs, believes that an ounce of prevention is worth a pound of cure.

The fire protection system is not confined to the surface alone but has been extended underground as well. In each of this company's mines there is a fire house built of concrete. Here 200 ft. of hose is kept, together with a complete chemical outfit and all the necessary tools. The men underground as well as those upon the surface receive regular training in fire fighting.

Current Needed for Motor or Lighting Load Depends on Power Factor*

BY S. N. BROOKS
St. Louis, Mo.

AS A GENERAL proposition it may be stated that no more power is required for a 40-amp. motor load than for a 40-amp. incandescent-lamp load. However, on alternating-current circuits the power factor must be considered.

With an alternating-current circuit of less than 100-per cent power factor a part of the current is "wattless." The power factor of incandescent-lamp loads is quite high, usually in the neighborhood of 100 per cent. The power factor of alternating-current motor loads may be low. Thus, with direct-current, 10 amp. at 100 volts is equivalent to 1,000 watts of power. But with an alternating-current load at, say, 80-per cent power factor, a 10-amp. load at 100 volts would be equivalent to: $10 \times 100 \times 0.8 = 800$ watts of actual power.

*Copyright; all rights reserved.

Ring Fire and the Flashing of Commutators and Their Prevention*

Electric Arcs Often Encircle Commutators Passing from Bar to Bar with the Aid of Fine Conducting Material That Becomes Incandescent

BY O. P. FORSTER
St. Louis, Mo.

"RING FIRE" is the designation that has been given to that kind of sparking where rings of "fire" (electric arcs) embrace the circumference of the commutator, either wholly or partly encircling it. Ring fire may be subdivided into two classes: (1) Ordinary ring fire, which is of a reddish tint and may exist to a limited extent on all commutators; (2) Armature-defect ring fire, which is of a bluish-green color and more intense than that of the ordinary variety.

Ring fire is originated ordinarily by minute arcs that form between adjacent commutator bars. Conducting materials that may lodge between the bars in or on the surface of mica insulation aggravate the tendency to arc. Current passing between the bars through these conducting paths renders the particles incandescent. Fine carbon which is ground from the brushes by the normal operation of the machine, or particles of copper from a newly-turned commutator, are the most prolific sources of this difficulty.

Secondary sources of ring fire are the oil, paraffin and commutator compounds sometimes used. Particles of conducting material may lodge upon these lubricants. Furthermore, oil may carbonize on the mica segments, thus forming a conducting path. In cases of trouble where the mica insulation between certain of the segments has been eaten away it is probable that the difficulty arises from the carbonizing of the oil or of some of the other materials enumerated above.

Undercut commutators, particularly those rotating at low peripheral speeds, are particularly subject to ring fire. The reason is that oils, greases and conducting materials can, because of the undercutting, lodge readily between segments. Hence the commutator slots of slow-speed machines should be cleaned frequently with a stiff brush. This is to prevent the lodgment therein of these semi-conducting materials.

In certain types of machines the voltage between adjacent segments under the pole tips may of itself be sufficiently great to produce ring fire. A compensated winding provides an effective corrective for this difficulty. Where the mica segments are thin, ring fire is correspondingly likely to occur. Furthermore, it may be encountered more frequently with slow-speed than with high-speed machines. With a high-peripheral-speed machine, the commutator segments do not remain a sufficient length of time in the zones where ring fire is developed to permit the formation of minute arcs.

Flashing is that species of commutator sparking where an arc attains considerable length and finally leaps viciously between brush-holder studs. Flashing may occur in a normal machine at the instant when an excessively high electromotive force is impressed across its terminals. It may arise, on the other hand, from the cumulative effect of a number of the causes that promote sparking. Flashing is more likely to occur on motors than on generators.

*Copyright; all rights reserved.

Commerce Commission Unmoved by Arguments for Modification of Order No. 7

Storm of Protest from Industries Affected Was Anticipated—Cement Association Contends That Preference in Open-Top Cars, by Handicapping Building and Road Construction, Hampers Improvement of Terminal Facilities

JUDGING from the questions asked and the general attitude of members of the Interstate Commerce Commission at its hearing in the matter of supply, exchange, interchange and return of open-top equipment, that body is disposed to stand squarely on its Service Order No. 7. The attitude of the commission, as well as the apparent failure of the opponents of the service order to make an impression with their arguments, leads to the assumption that the commission probably will extend the limiting date of its service order.

It was the desire of the commission that those who oppose the order be heard first. The preponderance of the early testimony at the hearing had as its object modification of the order so as to allow greater use of open-top cars for the handling of commodities other than coal. An extensive array of facts and figures was presented. An effort was made to prove that a large number of men would be thrown out of employment and great losses come to the industries which are large users of open-top cars. The sand, gravel and broken-stone interests; the constructional industries and those interested in road building made the principal presentations.

NO UNFORESEEN ARGUMENTS ADVANCED

It is regarded as doubtful, however, if any points were brought out in the arguments made by these interests with which the commission was not familiar prior to the issuance of Service Order No. 7. Members of the commission have stated that it was realized fully before the order was issued that there would be the greatest pressure brought to bear against it. Practically every witness advocating modification of the order was asked if he regarded it of first importance to keep essential industries going and to supply sufficient fuel for domestic needs. This was admitted by the witnesses, but they questioned that the situation is sufficiently serious to justify the economic losses which they are being called upon to suffer.

Many contended for the return of a priority arrangement. The commissioners asked how these priorities could be administered. There was no effort made to belittle the difficulties which such a policy would entail and some regarded the re-establishment of the Fuel Administration as necessary. It was admitted that some large central organization would have to take charge of the matter.

J. D. A. Morrow, the vice-president of the National Coal Association, as spokesman for 2,100 bituminous operators, commended the wisdom of the commission in issuing the order and opposed the effort to modify or rescind it. Extracts from Mr. Morrow's testimony follow:

The coal industry, in urging the continuation of Service Order No. 7 or the promulgation of any order which will provide ample transportation for the needed supply of coal, seeks to secure its proportion of available transportation, which it is not now and has not for some time

been receiving in many sections of the country, and also to provide the United States, Canada, and to a limited extent other countries, with that supply of coal which is vitally necessary for the welfare of the people.

Our estimate of requirements, which is the opinion of those best posted in the coal industry, and to some extent based upon official and available government statistics, is that a production of 545,000,000 tons for the coal year beginning April 1, 1920, and ending March 31, 1921, is the minimum amount that will carry us through.

The production from April 1, through the week of June 26, according to the Geological Survey figures, was 121,000,000 tons, or at the weekly rate of 9,235,000 tons. To produce 545,000,000 tons for the coal year in question will require a production of 424,000,000 tons for the remaining thirty-nine weeks of the coal year, or an average weekly production of 10,807,000 tons. Production for the week ending July 26 was 10,400,000 tons, and it is estimated the production for the week ending July 3 was approximately the same. The production for both of these weeks came about while Service Order No. 7 was in effect.

The maximum production of 10,400,000 tons a week reached during the present coal year is entirely insufficient to meet the requirements, even though that production was reached each week for the entire remainder of the coal year. It must be borne in mind that transportation during the winter months is at a lower ebb than during the summer months, when the weather is so much more favorable. We estimate the minimum weekly production during the remainder of the open season which will enable the coal operators to fulfill the year's requirements to be 12,000,000 tons.

LAKE SHORTAGE CONSIDERED GRAVE

The gravity of today's shortage is strikingly brought to our attention by the Lake Michigan and Lake Superior dock situation. On June 30, 1919, there had been loaded on vessels as cargo coal consigned to the Upper Lake docks 8,813,000 tons, while for the period ending June 30, 1920, the loading was 3,594,000 tons, a shortage of 5,219,000 tons or 104,000 carloads. To this must be added a further shortage of 5,000,000 tons which was carried over from the 1918-1919 season. The New England situation is somewhat parallel to the Upper Lake situation, and while not as acute, is very serious. Similar conditions existing in other parts of the country reflect plainly to any student of the situation the acute shortage confronting us at this time.

The coal operators must stand ready to supply the home needs or domestic requirements of the United States and doubtless also of Canada ahead of overseas export obligations, but they ought not to be asked or forced to withdraw coal from overseas export trade in order to give it to factories which will use it to manufacture products for overseas export. If that were done it would be a discrimination against the right of the coal operator to engage in overseas export trade as compared with the right of any other business man.

The impression that a great volume of overseas export coal business has produced a shortage in the United States is not supported by the facts. The total overseas export of bituminous coal to July 1 was only about 8,000,000 tons, but in that time the total shortage throughout the country is approximately 35,000,000 tons. Thus, if all the overseas exports had been kept within our own borders, we would still be 27,000,000 tons short.

Not only is it rank discrimination against the coal producer to deny him the right to engage in export trade and

use his coal to enable other business men to export their products, but it is not practical to prohibit the overseas movement of coal, even if it were determined upon. Much of the coal which originates upon the Norfolk & Western, Virginian and Chesapeake & Ohio railroads could not be utilized if it were not exported overseas. Tide-water consumption would not absorb it and it could not be diverted inland because, as Mr. Gutheim, of the commission on car service, says, the West bound capacity of the railroads would not permit its shipment West.

The supply of coal available for the coal consuming public is dependent upon the number of coal cars delivered to the mines for loading, and prompt movement therefrom to destination.

The National Coal Association strongly urges a sufficient supply of cars at the mines as the only means of meeting this grave emergency. The carriers themselves having failed, possibly due to conditions beyond their control, to provide the necessary transportation for the movement of coal sufficient to protect the country's needs, the duty of providing the transportation sufficient to carry out the program I have outlined rests with the commission.

Transportation sufficient to meet this program will result in an increased coal supply and at a reduced cost to the consumer.

PUBLIC UTILITIES WANT ASSIGNED CARS

Representatives of public utilities made a strong point of the fact that they are able to secure only fifty or sixty per cent of the coal called for by their contracts. The inference was left that the coal which should have been delivered on these contracts is being sold as free coal as to participate in the high prices in the spot market. The public utilities took a determined stand on their contention that nothing less than assigned cars for public utilities would solve their difficulties. They testified that their needs have increased very little over last year, their load factor remaining practically the same. It is declared that because of coal shortage it has been necessary to ration power. Every economy has been exerted to save fuel, it was declared, even to the extent of providing for interconnection between different power companies where the peak load came at different hours. It was denied that the public utilities had gambled on the fact that they would have to be given priority. It was asserted that every effort has been made to accumulate stocks.

In answer to the suggestion that the power companies could cut off supplies of power from non-essential users it was declared that this action could not be taken except on orders from authorities with competent jurisdiction. Only orders of that character could protect them from damage suits which certainly would be brought against them if they should act on their own initiative.

Many of the witnesses appearing against the order laid great emphasis on the volume of exports. It was significant that each time this matter was referred to, Chairman Aitchison would ask if the benefits they anticipated would be obtained when only one car in forty is exported. These witnesses also were asked if they felt the United States owes any moral obligation to furnish some of the coal necessary to keep people of Europe from freezing, and if it is not in the interest of American business to prevent the economic collapse in Europe which would follow if some of its industries were forced to close on account of the lack of fuel.

Typical of the arguments made looking to the abrogation or modification of Service Order No. 7 was that of the Portland Cement Association. Its argument is as follows:

The Portland Cement Association joins with other construction industries in seeking this opportunity to present

facts and opinions regarding the traffic situation in the hope that with the new information that may thus be placed at the command of the commission there may result:

(1) Immediate relief to the construction industry through change or abrogation of Service Order No. 7.

(2) The establishment of a fixed policy that will prevent in the future, except in time of war or other extreme emergency, any resort to preferential treatment of shippers or the establishment of priorities.

We are not unmindful of the complicated and grave character of the situation which confronts the commission, in that it is called upon to guide the policy of railroads physically unable to take care of the traffic offered.

Nor are we unmindful of the fact that a serious coal situation faces the country. In certain sections the stocks of coal are low and it becomes necessary for the maintenance of industrial and domestic welfare in those sections that stocks be accumulated. But with the quantities of coal already produced this year, several million tons in excess of that produced during a similar period last year, as we are informed, there would seem to be no insurmountable difficulty to build up stocks of coal in those sections of the country reported to be in distress without general derangement of the traffic facilities of the eastern half of the country.

It hardly appears fair or logical to give priority for the transportation of all coal for all uses and to all parts of the country when an emergency shortage exists in but a few well defined sections of the country, and for certain specific uses only.

CONSTRUCTION INDUSTRY SORELY HANDICAPPED

The cement industry has a two-fold interest as regards the effect of Order No. 7. Whatever tends to curtail the construction industry has direct influence on the cement business. Also many cement mills are dependent on open-top cars for raw materials.

Since November, 1918, the construction industry, second only to agriculture, has been continuously handicapped. Governmental restrictions, increased cost, labor shortage, production shortage, lack of transportation facilities, have all combined to prevent construction enterprises. The construction industry is basic. Whatever tends to curtail this industry is certain of far-reaching effect and if carried much further must result in great industrial depression.

The situation is rendered all the more serious as in the past three years there has been a marked deficiency of completed structures. During this time the demand and the need have been increasingly urgent for all classes of buildings, farm structures, roads and railroad construction. There is a deficiency today of not less than one million homes.

At the present time there are actually available for highway construction over seven hundred million dollars, money that cannot be used for other purposes. These roads, if constructed, will be of great help in lessening railroad terminal congestion.

It is recognized that terminal congestion plays a far larger part in the present difficulties of the railroads than the moving of business over the roads out on the lines. Much of the terminal congestion results from the short-haul shipment of necessary food products for the daily subsistence of the people living in our large cities. Therefore not the least among the structures for which need is most pressing are improved roads, in order that motor trucks operating over such roads may in taking over a greater share of short-haul traffic contribute in still greater degree to the relief of terminal congestion. Not only should new roads be built but those now in use must be maintained.

The country over, contractors and contracting organizations find their entire business capital jeopardized and ruin staring them in the face because of inability to secure necessary materials, such as sand, gravel, lime, cement and other basic construction materials.

The structures into which these materials enter add to the permanent wealth of the country. Materials and labor which go into construction work are not consumed but are transformed into a house, industrial building, county highway, or water-power development and in this transforma-

tion become additions to the permanent, taxable wealth of the country and also become tools for production of additional wealth.

It was expected and hoped and there was every prospect at the beginning of the year that construction operations would be active and real progress made in replenishing the depleted plant of the country. Without this construction increased production, a prime necessity the world over, cannot take place.

It should be borne in mind that the results are more than the immediate suspension of construction projects, disastrous as they are. Contractors with equipment lying idle and deteriorating, organizations scattered, and expenses continuing, will of necessity have to recoup and it will be the cause of a continued increase in prices. For every hazard which a contractor must shoulder the public must pay an increased price. This is the insurance the contractors will demand. Therefore, there is seen the importance not only of some immediate relief but of the establishment of a policy that will remove as far as possible such transportation hazards as have been experienced this season.

In this general disturbance to construction activity the cement industry is seriously interested. It is also directly concerned with the movement of raw materials in open-top cars. Many mills are today curtailing production because of non-receipt of raw materials, and in a few instances mills are compelled to close and remain idle, their workmen without pay.

SAY ORDER FAILS TO ACCOMPLISH PURPOSE

We therefore take this opportunity respectfully to point out to the commission:

(1) That the arbitrary derangement of traffic facilities, first, under order of the Commission on Car Service of the American Railway Association through Circular CCS-33, and later under order of the Interstate Commerce Commission known as Service Order No. 7, has not accomplished what we believe was the intent of the commission, namely, to have coal distributed where needed and to keep down prices; but has caused a most serious condition to be faced by all interested in the construction industry.

(2) That the principle of giving to a single industry arbitrarily an undue proportion of the transportation facilities of the country is wrong and in practice is found to accentuate many-fold the difficulties which it was the intent to correct.

We all recognize there is a shortage of transportation facilities just as there is a shortage of many other essential factors in the industrial progress of the country. But arbitrarily to assign to any given group of shippers an undue share of the restricted facilities creates an unbalanced situation which threatens the whole industrial structure.

We strongly believe and urge that the Interstate Commerce Commission should use its great power to see that transportation facilities are furnished to all shippers, who should share and share alike. That if there is a shortage at any particular point or section of the country of a given commodity, as for example coal, the remedy does not lie in a general derangement of transportation facilities and the curtailment of such facilities to essential industries.

In closing, we submit that to throw the entire burden and responsibility for carrying this burden, due to the shortage of transportation facilities, upon the construction industry is an unsound business policy, is unfair to the public and unjust to the contractors and material producers who now face financial ruin. And we ask that Order No. 7 be modified to correct these conditions and that a fixed policy be established that will prevent in the future priorities and discriminations against or in favor of any industry.

The carriers contend that they are enforcing Order No. 7, despite claims to the contrary. The best proof of this, their representatives say, is the volume of protest which has gone up against it. They also point out that there is agreed deal of talk about plants which are about to close on account of coal shortage, but that none of them has been closed thus far. Even in cases cited of plants being closed on account of shortage of coal it is asserted that the unsatisfactory price situation

with regard to product probably was the real reason for cessation of activities.

George H. Cushing, the managing director of the Wholesale Coal Association, stated that his organization is disposed to ask for the cancellation of service orders No. 5, No. 6, and No. 7, "because our information leads us to believe that there is no shortage of coal now, nor is there likely to be a shortage. The people are in a mood now to buy all the coal they are going to want before April 1 next. However, we are not justified in saying there is a shortage merely because that demand exists." Continuing, Mr. Cushing said:

"There has been enough coal produced to satisfy all current needs. There has been very bad distribution of that coal. Some have too much, other have not enough."

Mr. Cushing was asked to indicate what he regarded as a high price for coal. He said anything above \$5.50 at the mines is without justification. He expressed the opinion that the reconsignment privilege is not being greatly abused and that its function in allowing the consignor to give coal to those who need it most greatly offsets any use of the reconsignment privilege in selling the coal to the bidder who will pay the highest price.

Eugene MacAuliffe made a specific recommendation to the commission urging that the railroads be given a specific daily stint of coal hauling instead of many detailed orders as to the distribution of open-top cars. His idea is that from now to October 1 there must be two million tons of coal hauled away from the mines each working day. If the roads are required to do this much before they undertake any other revenue freight work they can then do about as they please with the rest of the cars and no harm can come to the fuel supply of the country.

ESTIMATES COUNTRY'S COAL REQUIREMENTS

These estimates are based upon the assumption that we shall have a total need of bituminous coal in 1920 of 550,000,000 tons, of which perhaps fifteen million will be to afford a working margin toward the exigencies of winter traffic problems. MacAuliffe would have two million a day provided till Oct. 1, 1,900,000 a day from then to December 1, and then 1,600,000 per day in December. This with the 256,000,000 mined before July 1 would make up the total demand. However he does not suggest just how the Interstate Commerce Commission should go about fixing for each railroad the amount of the coal which it is to be responsible for, nor more particularly how to care for the roads that have no coal traffic originating on them. These problems are believed to be relatively easy, however, it seems.

Among the other points recommended by Mr. MacAuliffe are the following:

- (1) Revoke the assigned-car privilege.
- (2) Enforce prompt unloading by coal users and reduce the amount of coal which the railways themselves are permitted to store in cars.
- (3) Discontinue all joint service of several railways at a single mine as unnecessary duplication of railway effort.
- (4) Revoke the privilege of reconsigning coal.
- (5) Require the carriers to police the car service and mine ratings so that they will be responsible for reasonable distribution between mines.
- (6) Reconsider the enforcement of zones and distribution practice of the Fuel Administration days.
- (7) Eliminate, by criminal prosecution if necessary, the practice of discrimination in car switching and placements—the result of tips and fees for preference now known to exist.
- (8) Require the loading of only clean coal.

NEWS FROM

THE CAPITOL

BY PAUL

WOOTON



President Appoints Engineer Officer of Federal Power Commission

LIEUTENANT Colonel Wm. Kelly of the Engineer Corps has been appointed by the President to serve with the Federal Power Commission as engineer officer. Much of Colonel Kelly's experience in the Engineer Corps has been in California, where he has been brought in contact with water-power problems. He took the 117th Engineers to France. Later he was promoted to chief engineer of the Fourth Army Corps. From that post he was promoted to base commanding officer.

Trade Commission Issues Fifth Report on Bituminous Production Costs

THE fifth report of the Federal Trade Commission's series on the cost of producing bituminous coal in the United States, covering the States of Ohio, Indiana and Michigan, has been made public and will be available for general distribution.

This report, like the previous ones of this series, presents information for the period August, 1917-December, 1918, based on monthly cost reports filed by the operators on forms prescribed by the commission and covers about 93 per cent of the output of Ohio during 1918, 86 per cent of the output of Indiana, and practically all of the output of Michigan. Information also is presented for certain districts for 1916, 1917 and 1918, based partly on information obtained by the commission's agents directly from the operators' books and partly on cost sheets submitted by the operator. This latter information covers from 20 to 89 per cent of the total output for the various districts.

Seeks to Enjoin Assignment of Cars By the Pennsylvania R. R.

AS A further step in the programme of the National Coal Association in its effort to have assignment of cars vacated by legal action, an injunction suit has been begun in the central Pennsylvania field.

T. H. Watkins, president of the Pennsylvania Coal & Coke Corporation, has filed a suit in the Court of Common Pleas in Cambria County, Pennsylvania, against the Pennsylvania Railroad Co. to restrain it from resorting to the "assigned-car" practice.

In its bill of complaint the Pennsylvania Coal & Coke Corporation, which mines bituminous coal, alleges that because of the assigned car practice it lost \$35,000 during the month of May through lack of cars that it needed to carry out its contracts. While the corporation's mines were obligated to shut down part time, through lack of cars, mines favored by the railroad, the bill alleges, got far more than the proportionate allot-

ment of cars they were entitled to by the rating system.

Because of the shortage of cars at the corporation's mines, with consequent curtailment of coal production, it is alleged, the corporation has experienced difficulty in keeping its men at work. Many of its workers have left the employ of the corporation and have gone to fields where assigned cars are supplied by the Pennsylvania R.R. or to other industries.

Require More Data in Car Relocation

ON JULY 6 the Commission on Car Service of the American Railroad Association issued to the railroads Circular CCS-51, as follows:

At the request of the Interstate Commerce Commission and to guide the Commission on Car Service in the relocation of cars, a report will be required showing the interchange of cars with your connections.

This report will show separately the open cars (exclusive of flat cars) and box cars (including auto, furniture and vent) received from and delivered to each connecting line at each junction point, with a total for the complete interchange with each railroad. The figures will be compiled four times monthly for the periods ending 8th, 15th, 23d and last day of the month.

At points where cars are delivered to a connection through an intermediate switching line the cars should be reported as interchanged with the overhead line and not with the switching line.

The report should be worked up in the car record office daily, based on a check of the interchange reports as received. The report should include all cars for which interchange record is received in the car record office during the period of the report, regardless of the date of movement. This will permit closing the report on the dates mentioned and mailing the information immediately to this office.

Make first report to cover period July 1 to 8 inclusive, making check of reports already in the office to do this. Report should be sent in duplicate.

Form CS-22 will be revised in accordance with the above and future reports will be known as CS-22 (revised). The roads heretofore making reports of coal cars interchanged on Form CS-22 will include additional information requested as to box cars effective at once.

Sumner Smith Resigns from Bureau of Mines

SUMNER SMITH, who has served for a number of years as mine inspector in Alaska for the Bureau of Mines, has resigned to enter the service of the Alaska Engineering Commission. It is understood that he is to take charge of the coal-mining operations which will be done for navy account.

E. A. Holbrook Inducted Into Office

E. A. HOLBROOK took the oath of office as assistant director of the Bureau of Mines on Saturday, July 10.

Modify Form of Weekly Freight Report

CIRCULAR CCS-53 of the Commission on Car Service of the American Railroad Association, issued July 8, appraises the railroads of modifications in weekly reports of revenue freight loaded and received from connections, hereafter to be designated as Form CS-54 (revised), as follows:

(1) Addition of items "Coke" and "Merchandise L.C.L.," which is found to be necessary. It is not expected that you will have a special recount made of the previous years' figures for this report; if such information is now available it will be very helpful if given with the current report.

(2) Special attention is called to directions respecting cars in switching service, both as to intra-terminal movements and cars received from switching roads.

(3) It is essential that the report be mailed before or on Tuesday following the Saturday previous on which day report is closed. If for any reason unusual delay is entailed it will be appreciated if a report is made by telegraph, using code words and letters as provided.

Report on revised form should be rendered beginning with the week ending Saturday, July 17.

Ferry Would Have Government Operate Four Hard-Coal Mines and One Washery

GOVERNMENTAL acquisition and operation of experimental coal mines, both anthracite and bituminous, were urged on July 9 in a proposal laid before the Anthracite Coal Commission by Thomas Kennedy, president of district No. 7, United Mine Workers of America. As precedents for this departure Mr. Kennedy cited the operation of experimental farms and the building of experimental roads by the Department of Agriculture, and as his strongest argument in support of his suggestion he declared that the time had come to let the public know the exact truth about mining—management, equipment, costs and profits.

Mr. Kennedy's suggestion is known as the "Ferry Plan," taking its name from Neal Ferry, chosen by President Wilson to represent the miners on the Anthracite Coal Commission, who first proposed it at the recent tri-district convention of anthracite miners held at Wilkes-Barre. That convention approved and adopted the Ferry Plan, and the Anthracite Coal Commission is now asked to incorporate in its decision in the present case a recommendation to President Wilson that the government go into the coal-mining business.

Lest the operators fear that this would mean a step toward the nationalization of all the mines Mr. Kennedy said he believed the adoption of the plan would be the best insurance against nationalization, provided the operators co-operated in the experiment and profited by the lessons learned therefrom. In his statement to the commission he said:

"As Mr. Ferry told our convention, after thirty years of 'investigations' the government itself does not know the first thing about mining—the cost of getting out one ton of coal. He showed that official figures varied from \$1.25 to \$7.80 a ton, and he gave in detail the basis of his own calculations as a practical miner that the miner gets 69c. for each ton he mines.

"When this coal sells at \$12.75 a ton, or even as high as \$14.50, both miners and consumers justly become suspicious of the whole industry, and accordingly he suggested that the Government should take over four

anthracite mines and one coal washery, in order that a practical experiment can be conducted to ascertain the exact costs of producing and marketing a ton of coal in small, medium and large veins.

"I add to that the suggestion that a like experiment be made in the bituminous coal industry. Both the United Mine Workers of America and the operators should be represented in the management of such experimental mines, but absolute control should lie in the Government so that there could be no question as to the impartiality and reliability of the results reported from time to time. The Ferry Plan would cost the government nothing, for the money invested would be returned to the Treasury in profits on the coal produced and marketed."

Operators and Railway Executives Will Meet to Solve Coal Problem

COAL operators from every important producing state met in Washington on Monday, July 12, and after an all-day session, during which every angle of the present situation was discussed, adjourned after turning their case over to a select committee. The meeting was called by the officers of the National Association as a result of last week's developments, among the more important of which were definite indications that the administration is seriously considering the appointment of a Fuel Administrator with all the powers of the Lever Act and that the Interstate Commerce Commission is about to issue an order giving assigned cars to move coal to the Lakes.

So serious is the situation considered by the operators that, to avoid having the industry saddled with Government regulation, this meeting was called to put forth counter proposals. It is generally believed in Washington that there is no real sentiment in favor of reviving the Fuel Administration but it is recognized that the pressure from the Northwest and from public utilities generally in favor of such a solution of the coal question for these particular interests is so strong that unless some method just as effective is found by the operators acting in conjunction with the railroad executives the administration will be forced to transfer the powers of the Lever Act to some agency.

On one point there was unanimity of opinion among the operators assembled at this meeting, and that is that they cannot afford to recognize or be directly party to any step that savors of Government interference with the coal industry.

Many lines of action were discussed but finally all questions were referred to a committee composed of D. B. Wentz, J. P. Walsh, W. L. Andrews, C. P. White, F. C. Honnold, J. G. Bradley and J. D. A. Morrow, which committee was instructed to meet with a committee of American Railway Executives in New York.

Pat Flynn, Miner, Makes \$264 in Two Weeks

ASIX-FOOT Irishman, by name Pat Flynn, employed by Roy Brothers in their Highland Mine at Somerset, Pa., made \$264 in two weeks. He had no "buddy" to help him turn the trick. Mr. Flynn found time not only to earn the \$264 but to take some recreation. It is said this earning establishes a record.

Recommends Opposition to Frelinghuysen Coal Commission Bill

IN RECOMMENDING that the association oppose the Frelinghuysen Coal Commission Bill the Special Coal Shortage Committee of the Merchants' Association of New York City advanced the following reasons:

The bill calls for the appointment of a new set of men, most of whom probably would be ignorant of the industry, as no one competent to fulfill the task, certainly no expert with the necessary knowledge, would take the position at the salary named, in view of the fact that the bill demands that he shall not be engaged in any other business, vocation or employment.

The bill calls for unnecessary experiments at great cost, most of which are being competently carried on at the present time by other governmental agencies, including the Bureau of Mines.

Sections 17 and 24 are an unwarranted interference.

Section 13 provides for the possible establishment of a statutory zoning system, which system proved unfeasible when tried by the Federal Fuel Administrator during the war, while the question of distribution of coal as contained in Section 7 should be entirely beyond the power of any Federal Commissioner.

The act is unnecessary and superfluous in that its object seems only to be the resumption of war-time authority and practice and tends to demoralize industry and trade, already fighting to resume its pre-war condition.

The members of the committee are: William Fellowes Morgan, chairman; J. F. Birmingham, president of the Delaware, Lackawanna & Western Coal Co.; Willard S. Brown, of Willard S. Brown & Co.; Thomas D. Green, president of the Hotel Woodward Co.; Edward E. Loomis, president of the Lehigh Valley Railroad Co.; Thomas S. McLane, president of Jeremiah Skidmore's Sons; Wesley M. Oler, president of the Knickerbocker Ice Co.; R. A. C. Smith, former Dock Commissioner, and Burton F. White.

Commerce Commission Renders Decision on Demurrage Charges

AN IMPORTANT opinion has been handed down by the Interstate Commerce Commission in the case brought by the Wholesale Coal Trade Association of New York, in which demurrage charges and rules are attacked. The commission finds that the

Demurrage charges assessed on tidewater coal from Nov. 11, 1918, to March 2, 1919, both inclusive, were not unreasonable; that the demurrage charges assessed on tidewater coal from March 3, 1919, to March 31, 1919, both inclusive, were unreasonable to the extent that they exceeded charges based upon five days' free time and a demurrage charge of \$2 per car per day; that the demurrage charges and free-time rule in effect since March 31, 1919, have been and are reasonable; that the monthly period for adjusting credits and debits under the average agreement was not and is not unreasonable; that the difference in treatment accorded the complainants and the lake-port shippers does not constitute a violation of section 3; that the tidewater regulations are not unduly prejudicial to the smaller tidewater shippers, and that the record does not justify the cancellation of demurrage charges which accrued during the strike.

We have uniformly held that strikes which prevent shippers from loading or unloading cars afford no basis for relief from demurrage charges. Complainants contend that this particular strike, by reason of its duration and wide-

spread effect, should be regarded as an exception to the rule. The record shows that during the period of the strike the demand for coal was light, due to the mild winter and the accumulation of coal in New England. It is clear that a part of the demurrage accrued at the New York piers because of these conditions, as demurrage charges of \$203,807 accrued in February, 1919, during which month the movement beyond the piers was unimpeded and relatively large amounts of demurrage accrued at the other tidewater ports which were not affected by strike conditions, or, if so, only to a limited extent. The facts of record do not warrant a departure from the rule that strikes afford no basis for general relief of the character sought by these complainants.

Complainants refer to the failure of defendants promptly to issue embargoes against the shipment of coal to tidewater on account of the strike. One of the complainants asserts that it was erroneously advised by the Pennsylvania R.R. on March 4 that an embargo had been issued. Coal continued to move until an embargo was actually placed on March 12. This complainant also referred to embargoes on coal to South Amboy placed on March 5 and 6 by the Ligonier Valley R.R. at the request of the Pennsylvania R.R. which were cancelled on the same date that they were issued. Shipments continued to be forwarded until the embargo of March 12. The failure of the railroads to declare embargoes does not relieve the shippers from the payment of demurrage charges. A shipper may offer for shipment all he sees fit, but if he makes more shipments than he can handle it is not the carrier's concern. If demurrage then accrues the shipper alone is to blame.

New York Coal Wholesalers Assist in Search for Profiteers

IN an effort to assist the Department of Justice in ferreting out violators of the Lever Law the Board of Directors of the Wholesale Coal Trade Association of New York, Inc., has appointed a committee to tender to that department the co-operation of the coal trade. This committee, consisting of C. Andrade, Jr.; W. A. Marshall, Gibbs L. Baker and Charles S. Allen, was appointed at a special meeting of the Board of Directors held on July 2 and its efforts will be directed "especially to guiding the department to a full development of all the facts to the end that no action be taken by it until the person thought to have violated the law shall have every opportunity to place all facts in the possession of the Attorney General."

The association believes that the Lever Law "is being violated and the trade generally is being brought into disrepute by the fact that a few unscrupulous persons are taking advantage of the present situation" and "it is satisfied that it is the unanimous desire of the vast majority of the trade, all of whom are reputable business men, that assistance be given the department in its efforts to terminate the practices which are not only unlawful but tend to bring opprobrium upon the trade with which they are proud to be connected."

In its first statement the committee says that "it is incumbent upon the trade to purge itself of the element, which it knows to be extremely small, both as to numbers and volume of business done, which is bringing discredit upon that great number who are not turning the present conditions to their pecuniary advantage but are bending every effort to promptly move coal to their customers" and adds that a consistent policy of "refusal to deal in any manner with a person or concern that may reasonably be suspected of abusing the present situation" will be very effective in putting a stop to reprehensible practices.

The members of the association are warned, and non-members are urged, to "scrutinize all transactions with great care, and if there is the slightest ground for suspicion that undue advantage is being taken of the present conditions, that they decline to have any part in the transaction."

The committee will confer with the Attorney General and ask him before any attempt be made to indict a member of the trade that the committee be advised of the facts in his possession and every reasonable opportunity be afforded to the person or concern in question to submit to him, through the committee, a full statement of any facts in extenuation which it may be desired to present, with the further assurance that full consideration will be given such facts before action be taken.

Members of the trade who are in possession of facts which will tend to establish violations of the law are not only invited but are urged to present them to the committee.

Indiana Considers Purchase and Operation of Coal Mine

OPPPOSITION to a state-owned coal mine in Indiana is crystallizing rapidly. Coal operators are watching with more than ordinary interest the attempts of the state purchasing committee and Governor James P. Goodrich to induce the State Legislature to purchase a mine and sufficient coal cars to provide the state institutions with coal. In the meantime the state contracts have expired and the state is in the open market, buying from hand to mouth, as it were. Operators are saying little about the project and what little they are saying is not for publication.

Opposition to the proposition first began with some of the state officials themselves. Many prominent citizens in Indiana have expressed doubt as to the wisdom of the scheme, saying it savors too much of socialism and would result as disastrously as the "government-ownership of railroads." The United Mine Workers will object strenuously to any attempt on the part of the state to employ convict labor in the mine. Many are of the opinion that the purchase of a mine would open the way for the use of such labor and it is believed that they will have to be convinced that no prisoners from state institutions will be employed in operating the mine before they will withdraw their objections.

COAL MINING CLASSED AS EXTRA HAZARDOUS

The United Mine Workers point to the fact that the State Workmen's Compensation Law provides a separate classification for coal mining on the ground that it is the most hazardous occupation in Indiana. The courts have upheld this contention and the monthly reports of the board usually indicate more accidents in coal mines, particularly fatalities, than in any other industry.

It is not certain that the state joint purchasing committee at present has any legal standing and therefore it might be involved in litigation should it attempt to buy and operate a mine.

After extra institutional appropriations are made by the legislature at the special session only \$500,000 will be left in the treasury, or the amount that the mine and coal car project would require. Meanwhile members of the joint purchasing committee are inspecting various mines in the western part of the state with a view to purchase. The opposition, however, is getting set for

a fight on the floor of the legislature when the proposition is introduced.

The purchasing committee was created by a rider on the regular appropriation bill of 1919 and it is believed by some legislative students that the Legislature must enact a specific measure to give the committee full authority and qualify it to act as a state department. The committee is not mentioned in the title of the appropriation act. The question raised does not affect the legal status of the committee to act as a purchasing agent for state institutions, it is said, but makes it doubtful whether it can serve as an official branch of state government to the extent the mine project involves.

Recently the committee visited Vandalia coal mine No. 74 in Vigo County, but, according to Cairy Littlejohn, state mine inspector, and David N. Curry, state representative, a report advising against its purchase will be made. They say the mine is in an unfavorable condition. Other mines will be visited, however.

Mine operators have not shown any inclination to enter into a contract with the state to provide the state institutions with coal. The coal situation in Indiana is entirely too precarious. Mr. Littlejohn said he talked with an operator just before the expiration of the present contract, July 1, and the operator told him he would not enter into a contract with anybody to provide coal for a year at \$5 a ton.

Governor Goodrich believes that were it not for a passage in the Esch-Cummins Federal Transportation Act the state would not now find itself in the pinched condition resulting from inability to get coal at reasonable prices. The federal law provides for the allocation of available coal cars to coal mines on a strict proportion basis, the only exception being in the cases of mines supplying railroads with coal. These mines are to receive 100 per cent supply, if available.

ARBITRARY INTERPRETATION BY COMMISSION

The state officials first attempted to arrange with the Interstate Commerce Commission to provide state-owned cars so that mines supplying the state should receive cars sufficient to keep them in operation at least long enough to fill the state coal requirements. The commission, however, interprets the law to mean that whoever may own the cars, the mines can receive no more than their proportionate allocation.

Governor Goodrich said: "Of course, if the Interstate Commerce Commission takes that position, it would be folly for the state to buy its own cars. If the commission maintains this attitude it will compel Indiana to pay at least \$150,000 more for its coal this year than it could buy it for otherwise, and it won't help the situation one bit. It permits railroads where a mine sells its entire output to railroads to supply 100-per cent service. Why can they not where the state operates a mine, permit the railroads to supply 100 per cent car service? If the commission will do that, it will solve our difficulty. Everyone understands the state would have this coal. It is in the preferred list. It would not affect the general result one bit to put us on the same level with the railroads themselves and it would enable us to get a steady supply of coal at a much lower price than we could possibly buy it for if they are to maintain that position."

John W. McCardle, vice-chairman of the Public Service Commission, and Senator James E. Watson, from Indiana, are to take up the proposal again with the commission this week.

Warriner Shows Up Many Misinterpretations of Fact in Lauck's Voluminous Exhibits

Slow Working Time Is a Thing of the Past and Cannot Recur—Lauck's Estimate of Number of Working Days in 1919 Is Nearly a Full Month Too Low—Pennsylvania Works More Steadily Than the Average Coal-Mining State

AFTER an adjournment of over a week the Anthracite Coal Commission met at Scranton July 7, and, after the usual formalities, Jett Lauck discussed two of the exhibits that he had presented without comment at the prior meeting of June 28. The titles of these exhibits were Exhibit 24, "The Sanction of the Eight-Hour day," and Exhibit 26, "The Occupation Hazard of Anthracite Mines."

Mr. Lauck desired to show by the first of these exhibits that the eight-hour day tends to increase output, the men working more diligently and effectively when less fatigued by the previous day's stint. He gave examples which seemed to him to prove the truth of his assertions. He also stated that extra hours were a primary cause of accidents and when asked by Chairman Thompson to support that statement by actual figures he replied that he could not do so, but he affirmed that it was the consensus of opinion that shorter hours meant a shorter casualty list, which was ever an important desideratum.

LONG HOURS KEEP MINE WORKER FROM FAMILY

He then argued that any working day longer than eight hours kept a man too long from his family and from that recreation which he needed and was entitled to enjoy. The longer working day prevented the foreigner from studying English and therefore incapacitated him from qualifying for effective citizenship. Moreover any greater number of working hours than eight per day was detrimental to the worker's health.

Mr. Connell, the operators' representative on the commission, pointed out that the anthracite industry is already on an eight-hour day basis except in the case of a few of the employees. This Thomas Kennedy admitted, but he declared that the miners wanted the eight-hour day extended to all employees and sought to have the matter made a general stipulation in the next agreement.

After Mr. Lauck had finished the presentation of his case it was agreed that the operators should cross-examine him as to the exhibits he had presented. In order that the discussion may not be too much involved it will be taken up in regular order point by point, though the cross-examination led back and forth from item to item.

S. D. Warriner commenced with Exhibit 3, which discusses the irregularity of employment in the anthracite industry. Mr. Warriner criticized the figures that the mine workers presented as to the number of working

days per year. In particular he objected to what he regarded as an unsubstantiated estimate regarding the activity of the mines in 1919. Mr. Lauck had the figure as 252 days whereas the anthracite managers claimed 273 days as the average working time, which, by the way, is 90 per cent instead of 83 per cent of full working time.

Mr. Warriner brought out the fact that Mr. Lauck's figure permeated almost every exhibit and rendered most of the calculations entirely misleading.

Mr. Lauck then said that he did not claim that the figure 252 was exact but that as far as he could estimate the figure was

correct. He could not see that it mattered what the figure was. Even if it was as high as the operators claimed, it would do no damage to the mine workers' argument. At this point it was brought out that if the mine workers' figures were merely estimates it was foolish to take up the time of the commission with them, especially as they were not only estimates but wildly erroneous estimates at that.

Mr. Warriner took up the table showing the number of days worked from 1881 to date and wanted to know why the average number of days for the anthracite region was calculated on a basis of forty years whereas for the bituminous region a period of only thirty years was taken. He added that if the basis of thirty years for each industry had been used the figure for the anthracite region would appear better than that which Mr. Lauck had obtained.

WHY CONSIDER ONLY PENNSYLVANIA MINES?

Mr. Warriner also wanted to know why the figures for the anthracite region were compared with those of the bituminous regions of Pennsylvania. Why not compare them with the figures for the whole bituminous industry of the United States? Mr. Lauck declared that he chose to compare the two sections of the state with one another, for he contended that they were more closely parallel. Mr. Warriner said that the Pennsylvania bituminous field was in a class by itself.

He urged that if a comparison had been made by taking the average number of days worked in the anthracite industry during the 40-year period and comparing it with the average number of days worked in the whole bituminous region, in Pennsylvania and its sister states, during the 30-year period, it would have been found that the anthracite mines had the advantage of steadier work.

Mr. Warriner then wanted to know what a record of the number of days worked in 1881-1890 had to do with

Lauck's ill-advised attempt to prove that the demand for anthracite during the war was unusual landed him in many absurd positions and the climax was reached when he tried to explain how in a short while the mines would be glutted with men—from the culm banks.

present conditions. Mr. Lauck declared that the period immediately before the war was the most important, and that the present period was abnormal and should be given no consideration. He stated that since the war there had been an abnormal demand for anthracite and that the industry could not look for a continuation of this demand.

WHAT WILL REDUCE DEMAND FOR ANTHRACITE?

Mr. Warriner wanted to know of Mr. Lauck on what grounds he based this contention. Mr. Lauck asserted that the bituminous industry was not able just now to fill the demands upon it owing to the war needs and to the present car shortage which today reduced the output of coal, and therefore the anthracite industry had to make good the losses of the bituminous industry. Further Mr. Kennedy stated that the bituminous operators as soon as they could catch up would probably resume the sale of sized coke in competition with anthracite and further reduce the sales of the latter. Therefore the industry would be apt to resume its pre-war status.

Mr. Warriner then pointed out that by Mr. Lauck's own figures the anthracite industry was becoming stable and that each year there were being more and more days worked, whereas in the same period the number of days worked in the bituminous regions had remained stationary and was now lower than in the anthracite field. Mr. Warriner added that the conditions at the present time were not abnormal and that for the time that the agreement was to be in effect conditions could be expected to remain the same and he elicited the admission from Mr. Lauck that this probably would be true at least until next spring.

Mr. Lauck then pointed out that the return of men to the mines would reduce the number of days worked, as the larger number then available would be able to produce the required output in less running days. But Mr. Warriner stated that the industry could absorb all the men it could obtain and still give them sufficient or full-time work, as the operators were unable to fill the demands of the market.

CULM-BANK COAL CAUSE OF LARGE OUTPUT

Mr. Lauck tried to show that the men had increased their output per man during the war period, but Mr. Warriner was able to contradict this by showing that the increase in production per man was due to the culm-bank coal that had been shipped during the war and was still being shipped. Mr. Lauck then said that if this culm-bank coal were no longer produced the men now employed at the culm banks would have to be employed in the mines.

Mr. Warriner immediately showed the fallacy of assuming that this would flood the mines with men and increase the output by stating that there were only 4,000 men employed at the culm banks, which is approximately 3 per cent of the total number of men employed in the anthracite industry, and of this 3 per cent less than 5 per cent are miners and hold miners' certificates. Hence these men would increase the force available for work in the mine by less than fifteen-hundredths of one per cent.

Mr. Dempsey then stated that the shortage at the mines at the present time was not in miners but in mine laborers and that one company with which he was well acquainted needed at least 1,200 men of this class, and if it could get them they would increase the output

of the same number of miners, enabling each of them to double his output. Mr. Warriner then showed that the production from culm banks was 10 per cent of the total output and that this was produced by 3 per cent of the total men employed.

Mr. Lauck then asked Mr. Warriner if it were not a fact that during the rush work of the war the machinery and mines had been allowed to run down so that in the future many delays due to breakdowns and repairs might be expected. Mr. Warriner answered him by stating that during the past seventeen years the anthracite industry had been installing the best types of machinery and safety devices and had reduced the dangers incident to mining. He declared that the repairs had been kept up and that no more delays than usual might be expected.

CONDITIONS IN THE TWO FIELDS REVERSED

Mr. Warriner then presented Fig. 1, which showed diagrammatically from figures presented by Mr. Lauck on page 8 of exhibit 3, "Irregularity of Employment in the Anthracite Industry," that, although the bituminous field worked in the past more days per year than did the anthracite region, conditions are now reversed, and have been reversed in all the years, with one exception, since 1914. Mr. Lauck represented as a fact that the conditions in the anthracite field were abnormal for that period. Then Mr. Warriner referred to Fig. 2 and explained that it had been plotted by averaging each year with the preceding and the succeeding year, using the figures from the same table. He pointed out that in the bituminous field for the past seventeen years the number of days worked had been practically stationary, while in the anthracite field the increase was healthy and continuous and that the last few years were not abnormal but what might have been expected from the indications in the industry in the years previous to the war.

Having completed the discussion on Exhibit No. 3, Mr. Warriner took up exhibit No. 5, entitled "Average Full-Time Weekly Earnings in the Anthracite Coal Mines of Pennsylvania."

To him it seemed neither fair nor reasonable to show the weekly earnings of one hundred men as if such figures were significant of the returns received by the 150,000 men employed in the mining of anthracite. Certainly such a method of analysis was apt to be rendered valueless by the obtaining of figures of wholly unrepresentative men. Mr. Lauck acknowledged the incompleteness of his figures and stated that they were based on the data that he had at hand, but Mr. Warriner pointed out that Mr. Lauck had figures available from which to secure the wages of over 7,000 men each year.

He could have obtained such information from the Workingmen's Compensation Commission of Pennsylvania, the source from which he had obtained the figures regarding the one hundred men. Mr. Lauck acknowledged that he would like to have the figures from the company's payroll but that he did the best he could with the figures obtainable and that although he could have used the wages of more men he did not have the time nor did he feel like going to that unnecessary expense.

During the day the question of admitting the miners' exhibits on profits, etc., was brought up, but final action on it was postponed. The meeting then adjourned until Thursday morning at 10 o'clock.

Mr. Warriner then discussed miners' exhibit No. 4. This exhibit is entitled "A Comparison of Earnings and Wage Rates in the Anthracite and Bituminous Mines of Pennsylvania." Mr. Warriner took exception to Table I, in which are compared the earnings for the two fields, and asked Mr. Lauck to explain the source of his figures. As a result of Mr. Lauck's statement Mr. Warriner then showed that the figures for none of the years were comparable as the proportion of employees

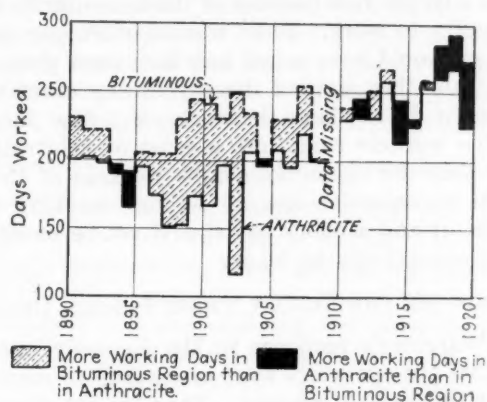


FIG. 1. SHOWS HOW MEAGER WORKING TIME SHIFTED FROM HARD- TO SOFT-COAL REGION

The black shows how the anthracite men are still in the grime of work when the bituminous men are resting.

in various types of employment differed in the two fields. For example, more boys are employed in the anthracite field than in the bituminous. As a result the wages of the boys reduced the per-capita earnings of the mining force. Average earnings can never be compared unless the character of the labor employed is taken into consideration, and in this case a simple comparison would be particularly misleading.

EXAGGERATED BITUMINOUS AND UNDERSTATED ANTHRACITE WORKING DAYS

Mr. Warriner showed that in drawing up his figures for 1919 Mr. Lauck had used different methods for calculating the wages of the men employed in the one field from that which he had used in estimating the wages in the other. In consequence the figures he obtained were not comparable. He showed also that Mr. Lauck used 252 as the number of working days per year in the anthracite field and 246 days in the bituminous field, whereas the correct figures are 273 for the anthracite and 225 for the bituminous.

This declaration caused much discussion, the mine workers' representatives declaring that the operators ventured to claim that Lauck's statements were incorrect without presenting any other figures to substitute for them. Mr. Warriner then stated that if Mr. Lauck had used the correct method of determining the earnings he would have shown that the anthracite miners earned more money in 1919 than did the bituminous miners.

Table VIII of this same exhibit, No. 4, which was captioned "Comparison of Daily Earnings in 1918 of Anthracite and Bituminous Mine Workers," caused a further disagreement between the operators and mine workers. This table gives the earnings by occupation of the two fields and shows by what percentage the wages of bituminous miners exceed those of anthracite miners. Mr. Warriner says that this table is not a fair reflection of conditions in the year 1918, as the

rate does not take into consideration the \$1 per day increase granted by the Fuel Administration in November. It is not, therefore, a proper comparison between the two fields. Mr. Lauck then pointed out that on the following page this fact was stated.

Mr. Warriner again asserted that the table was incorrect. It did not serve any useful purpose to put things that were not facts in the tables and then correct them in the text. Mr. Kennedy then asserted that the operators were trying to show that the miners were concealing facts and appealed to the commission and asked them to have Mr. Warriner answer his (Mr. Kennedy's) question which was to the effect "Are you not implying that you think that we deliberately falsified the table to conceal facts?" Mr. Warriner then said he was not.

COMPARATIVE DAY RATES MISREPRESENTED

Another part of this exhibit that aroused no little animated discussion was the table (numbered XIV in the *Coal Age* reprint) which showed the basic daily rates as fixed by the agreements. It was Mr. Warriner's privilege to show that these were not the basic daily rates but were selected rates and that in some cases they did not even approximate to averages. Yet more in one case, namely that for outside common labor, the figure given was below the lowest rate paid.

He showed that outside common labor, which according to Mr. Lauck was paid \$3.31 per day, included some boys who were doing work that in general was performed by men. These boys, he declared, were under 21 years old and therefore the companies that employed them in accordance with the agreement paid them only boys' wages. Before closing the discussion of this exhibit Mr. Warriner pressed his opponent, Mr. Lauck, until he reluctantly admitted that if his figures as to the number of days worked were incorrect, a statement which Mr. Lauck doggedly denied, it would to some extent destroy the value of his deductions.

Mr. Warriner then subjected Exhibit 7, entitled "Wages in Various Industries and Occupations," to his

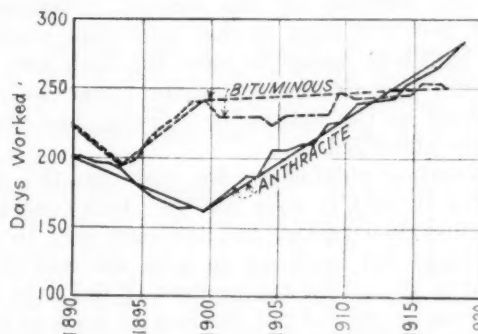


FIG. 2. OBTAINED BY PLOTTING WORKING-DAY AVERAGES FOR THREE YEARS OF OPERATION

Shows rapid growth in steadiness of run in anthracite region

searching analysis. It was credited to the "Bureau of Applied Economics, Inc." Mr. Lauck was asked if he was not a stockholder in this bureau and he had to admit that he was.

Mr. Lauck was then asked to give the sources of the figures appearing in the exhibit. He declared they were official. Mr. Warriner replied that they were not the figures as furnished by the anthracite operators especially for the year 1914.

The discussion shifted to Exhibit 12, on "The Relationship Between Rates of Pay and Earnings and the Cost of Living in the Anthracite Industry of Pennsylvania," which is reprinted at length in this issue of *Coal Age*, and the argument that resulted was at times most animated. Table I, which shows the relative wage rates since 1902, was the first point to be attacked. Mr. Warriner stated that if a similar table had been compiled for the bituminous industry prior to the recent wage settlement it would have shown a rate of only 168.50, whereas the rate shown by Mr. Lauck for the anthracite industry was 181.30. Thus the percentage rate of increase of the anthracite region exceeded the percentage rate of increase of the bituminous region by 12.8.

NO RIGHT TO CONSIDER STEADINESS OF WORK

A table which would indicate the present rate for the bituminous region would show a figure of 214. The figure, therefore, by which the wages of the anthracite mine worker should be increased is 32.70, and it would represent the percentage as applied on the wage paid before the strike settlements in 1902. Based on the present wage the increase would be not quite 18 per cent. The figure given by Mr. Warriner, based probably on other calculations, was 19.9 per cent. Mr. Warriner declared that during the war the rate of pay of anthracite miners had advanced 49.8 per cent, whereas bituminous miners' rates had increased only 34.6 per cent.

Fig. 1 of Exhibit 12 shows a comparison between the increase in the wage scale and the increase in the cost of living. As this exhibit with chart is shown in this issue of *Coal Age* it will be easy to follow Mr. Warriner's reasoning. On this chart is plotted a curve showing that the cost of living has increased 104 points. The stepped line below the curve of living cost shows the rates of pay during the same periods, and the difference between them is what Mr. Lauck declared the miner stood to lose due to the fact that the increased cost of living exceeded the increased pay.

Mr. Warriner then brought out the fact that the purchasing power of the earnings of the miner workers did not actually decrease by this amount. Steadier work had been provided them so that they were always able to earn sufficient money to meet the high cost of living. From now on the anthracite miner would have steady work as the anthracite industry has now been completely stabilized.

Mr. Warriner pointed out the fact that this table is misleading in that it does not take into consideration the working-time factor, and the only way to exhibit that earnings did not keep up with the cost of living would be to show that the product of the days worked and the rate of pay did not increase as much as the cost of living.

GOOD ARGUMENT WHEN MAKING SOFT-COAL PACT

During this discussion Mr. Kennedy said that in fixing wages the question of working time should not be considered. If the men worked more steadily, they produced more coal, and if their rate was to be reduced accordingly they would be penalized for the offense of producing that larger tonnage. There was no reason, said Mr. Kennedy, why men who worked more days should not be rewarded for it. Did not the operator gain enough by steady work? Why should he seek also the further gains that a wage concession would give?

He contended that steady work for the operation meant less overhead to the operator and should mean larger prosperity for the workman. Mr. Kennedy, growing warm, made the statement that if steady work only meant more work and no more pay for the worker he would advise the men in his district to reduce production to the level of 1914.

Mr. Kennedy probably remembers that the contention of the bituminous mine workers was that they should be paid a larger rate because of the irregularity of their opportunity to work. They wanted more pay per hour than they would have asked had they been given steady time. Thus they wanted the pay in any event whether they had or did not have the work. But now the anthracite mine workers come into a court of arbitration and declare that the bituminous mine workers of the international organization are all wrong—working time is not a factor and a man's pay should not be based in any way on opportunity to labor.

SHOW ME THE PENURY THESE FIGURES DENOTE

Mr. Warriner's response to Mr. Kennedy was to the effect that the operators were ever ready to meet honest effort with honest treatment. They did not wish to penalize the mine workers for their steady working time and increased production. But when a chart is produced and it is represented graphically on that chart that the mine workers were not allowed to maintain their standard of living but were being progressively crowded to the wall, he thought it necessary to protest and to show that increased opportunity to work had materially assisted the mine worker in meeting the situation.

Mr. Warriner added that if there were such a falling off in the purchasing power of the yearly earnings of the anthracite mine worker it should show in the scale of living, and he inquired of Mr. Lauck if he had made a survey of the anthracite field with the purpose of determining that point. Mr. Lauck said he had not, but he knew that previous to the war the conditions of the anthracite mine worker were deplorable and that the mine worker had been helped by the increased regularity with which he now worked.

To clinch his argument Mr. Warriner offered a table showing how advancing wage rates and increased steadiness of occupation had met the high cost of living, but the mine workers' representatives objected as the operators would not consent to be cross-examined at this time. The operators will present this table, however, when they give their testimony.

MINER SHOULD BE PAID AS SKILLED MECHANIC

Throughout the day the representatives of the mine workers took exception to the way in which the operators interweaved their examination of Mr. Lauck with argument for the operators' contentions. The chairman, however, did not view the operators' conduct of the case as in any way violative of proper procedure.

The session of July 9 opened with an inquiry by Mr. Warriner as to the reason for presenting Exhibit 9, entitled "Wage Rates in New York, Philadelphia, Pittsburgh and Buffalo." Mr. Lauck stated that the object was to show the rates of similar classes of work in near-by localities. Mr. Warriner asked why nearer cities than those chosen had not been given. Mr. Lauck thought that the rates supplied were typical of the rates of the region of which the anthracite field formed a part.

Leaving this point, Mr. Warriner referred to the inequality of the rates for the same class of labor. Mr. Lauck said that the rate depended on the industry in which the man was employed and added—what must Mr. Kennedy have thought of the explanation?—that a boilermaker might have steadier work than a man in some other industry and the wage be determined in part by the irregularity of the employment. Mr. Lauck declared that a skilled miner was comparable with a skilled mechanic and that he had presented the rates paid to such a man so that the commission might have that information as a guide to a settlement of what constitutes a fair wage for the anthracite miner.

VILLAGE VS. CITY INCREASES IN LIVING COSTS

Exhibit 8, "Changes in Cost of Living and Prices," next fell under Mr. Warriner's critical examination. He roughly assessed the town and country population as being equal in numbers and said that if, as Mr. Lauck asserted, the cost of living had gone up 110 per cent in the larger cities and 100 per cent in the country as a whole, the rural population could have suffered from only a 90-per cent increase in the cost of living.

In reply Mr. Lauck said that the figures quoted were but introductory and that the actual figures were to be found at the bottom of the page. The increase was 111 per cent for eighteen large industrial centers and 104 per cent for the country as a whole. Mr. Warriner countered with the statement that the increase in cost of living in smaller cities must then be less than 100 per cent.

Mr. Lauck did not agree with Mr. Warriner. He asserted that the eighteen larger cities amounted to only a small part of the whole population of the United States, far less than 50 per cent. Mr. Warriner then pointed out that these figures for the increased cost of living were higher than many individual estimates. Mr. Lauck replied that these figures were official Government statistics and were for the whole of the country whereas the other figures were only for parts of the United States.

SCRANTON NOT TYPICAL; FEW MINERS THERE

When Exhibit 10, entitled "Food Prices in Scranton in 1920 Compared with Prices in Other Cities," was introduced by Mr. Warriner he said that Scranton had been taken as one of the larger industrial cities in this country, but that being so Scranton is not typical of the anthracite region, though Mr. Lauck makes this claim in his exhibit, stating at the same time that Scranton is among the most expensive communities in the United States. Mr. Lauck acknowledged that this exhibit showed only a tendency. It did not attempt to establish a fact. The claims of the mine workers were not based on the prices in Scranton, but on the increase in the country generally, which was 104 per cent.

But if the Scranton exhibit were incidental and not primary, how shall we explain this second exhibit, entitled "Income and Expenditures of Anthracite Mine Workers in Scranton, Pa., 1920"? Mr. Warriner elicited from Mr. Lauck acknowledgement that the anthracite industry was not the predominant industry of Scranton. Mr. Dempsey agreed also that this was so, but added that the conditions were at least significant.

Mr. Warriner then cross-examined Mr. Lauck as to the manner in which the factors used in establishing the cost of living were obtained and urged that men

in different occupations and localities required different factors to suit their conditions. For this reason the figures were inapplicable to the anthracite field.

HAVE MINERS A YEARLY DEFICIT OF \$288?

Mr. Warriner called attention to the fact that the mine workers' exhibit showed a deficit in the income of the mine worker of \$24 per month. He asked how this deficit was made up, and Mr. Kennedy replied that it was being carried by the stores, whereupon Mr. Warriner said that if the deficit really existed it would bankrupt every store in the anthracite region.

Mr. Lauck said that there were two ways of meeting the deficit—decreasing the standard of living or going into debt. Furthermore, he added, the earnings of wives and children and the income from boarders helped to make up the deficit. Mr. Warriner then pointed out that this income had been taken into consideration by Mr. Lauck when he made his computation by which the mine worker was found to face a deficit of \$24 per month.

The deficit seemed to Mr. Warriner more than improbable, for it was a fact that savings-bank deposits had increased and not decreased, as would have been the case if outgo had been larger than earnings. In reply to this argument Mr. Lauck credited the bachelors who did not need so much for a living wage with swelling the saving-bank funds, and gave credit also to those foreigners who had not been able to send money to foreign countries since the war broke out.

LAUCK'S MYTH—A COMING FLOOD OF HARD COAL

So much for the morning. The afternoon was like a catechismal class in social economics, Mr. Warriner acting as professor and Mr. Lauck as catechumen. The first questions were as to the exhibit entitled "The Sanction for a Living Wage." Mr. Warriner called Mr. Lauck's attention to the fact that he had said that the call for anthracite was abnormal, being the outcome of the war. Suppose, Mr. Warriner said, the conditions of irregularity of employment in the anthracite industry did return, would that return not be accompanied by a decrease in demand in other industries and in a fall in prices, which would make the irregularity of employment no occasion for distress, or would it be necessary to meet the slow time with a further increase in wage?

To this Mr. Lauck replied that the depression in the anthracite industry would inevitably come and that the pre-war conditions of irregular work would be re-established. They were intolerable before; they will not be less intolerable when they recur, and the need of the anthracite worker is that he be given a scale equal to that paid the bituminous mine worker.

Mr. Lauck was not always recalcitrant. He even agreed with Mr. Warriner that an increase in the per-capita investment of capital increased the production per employee. Mr. Warriner did not find him so gracious when he was asked if men can receive more than they produce, and if it is true that it has been proved by figures that if everyone were paid what has been described as a "living wage" there would not be enough to go around. Mr. Lauck said that figures of that kind were incorrect and had been calculated improperly. However, duly pressed, Mr. Lauck admitted that, living wage or no living wage, one cannot possibly divide more than is produced.

Bulking exhibits 18 to 21 together as they all related to the budgets, being entitled respectively "Standard of Living," "Cost of Living in Coal Towns," "What a Living Wage Should Be" and "The Practicability of Living Wage," Mr. Warriner declared that a budget might be properly drawn up, but no one budget could possibly be representative of the whole country with conditions varying as they do with respect to localities and industries.

For considerably over an hour Mr. Warriner tried to induce Mr. Lauck to admit that the later budgets that had been prepared included items which did not appear in earlier budgets, and that the standard of living had increased at the same time as the cost of living. Mr. Lauck avoided answering this question as Mr. Warriner put it, but he did admit that the present budgets were minimum-comfort budgets whereas the old budget was a bare-subsistence budget.

Mr. Lauck then pointed out that these budgets were not to determine the wage rate but to show that the miners' demands of \$6 per day were extremely reasonable, as they were even below the subsistence level. Mr. Warriner then wanted to know if the miners wanted the same increase to apply to all other wage earners as to common labor. Mr. Murray said "No, but we want a flat increase of \$1 a day for all men now earning more than the \$6." Mr. Warriner then asked Mr. Lauck if he did not believe in differentials between skilled and unskilled labor, and he said he did and did not want to destroy the differentials. Mr. Warriner then pointed out that the mine workers' demand tended to decrease these differentials unless the same ratio of increase were applied.

Mr. Warriner then wanted to know whether the increase of income did not increase the expenditure of money, and if an increase in spending does not in turn cause an increase of prices. Mr. Lauck said that if the production stayed stationary an increase of spending would cause an advance in price, but if the quantity of commodities produced increased in proportion the price would not increase, even though the amount spent were increased.

This ended the cross-examination for the time being and a short recess was taken for a conference of the commission. After the recess the commission stated that on Monday it would hear the argument as to the jurisdiction of the commission regarding the introduction of the disputed exhibits. The commission then adjourned until Monday at 11 a.m.

Monthly Production of Coal During First Half of 1920

IN response to many requests the Geological Survey has issued estimates of the monthly production of anthracite and bituminous coal in the United States from January to June, 1920. The monthly figures, based on weekly reports of cars loaded by 137 bituminous and 9 anthracite carriers, are as follows:

	Anthracite	Bituminous	Totals
January	7,366,000	48,582,000	56,055,000
February	6,335,000	40,127,000	46,462,000
March	7,240,000a	46,792,000	54,032,000a
April	6,543,000a	37,939,000	44,392,000a
May	7,745,000a	39,753,000	47,498,000a
June	7,641,000a	43,710,000a	51,351,000a
Totals first six months..	42,780,000	257,010,000	299,790,000

(a) Subject to revision.

Mingo Grand Jury Indicts Hatfield, Miners and Detectives for Matewan Shooting

ON JULY 3, when the Mingo County grand jury completed its investigation of the Matewan (W. Va.) shooting of May 19, in which ten men were killed, and submitted its report to the Mingo Circuit Court, it was found to have returned seven indictments charging murder against Sid Hatfield, chief of police at Matewan, and against twenty-two other persons. The jury also returned an indictment against the twenty-three men for the malicious wounding of a Baldwin-Felts detective. Indictments were returned by the grand jury against the six Baldwin-Felts men who escaped from the shooting affray, charging them with the killing of Mayor C. C. Testerman and a boy named Otto Kingsley. A large number of indictments charging the unlawful eviction of miners from their homes also were returned by the jury.

In addition to the indictments already enumerated the grand jury returned indictments charging bribery against G. R. C. Wiles, state public-service commission chairman; W. A. Williams and J. M. Tulley. It is charged in the indictments that the men offered bribes to Deputy Sheriff J. F. Webb and Constable Dave Phillips conditioned on their resigning their positions, but the fact seems to be that Wiles had done no more than to endeavor to induce Webb to ask the organizers to leave the Mingo field and had not offered a bribe to him or to any other official.

Deputy Sheriff Webb, however, was indicted on a charge of accepting a bribe to cause Ezra Fry, an organizer, to be removed from the county. Fry also was indicted on seven counts for murder in connection with the Matewan tragedy.

The July term of the Circuit Court in Mingo County was scheduled to be opened on Monday, July 12, and all those indicted in connection with the Matewan affair have been called upon to be present to answer the charges made against them for participation in that affair.

Mine Workers Fined for Saturday Idleness

PHIL H. PENNA, secretary of the Indiana Bituminous Coal Operators' Association, and Ed Stewart, president of district No. 11, United Mine Workers, heard twenty-five cases last week in which miners were charged with violation of the Saturday work-day clause in the mine workers' contract. The hearings resemble a regular court with the exception that there are fewer suspended sentences and more convictions. About seventy-five cases remain to be heard.

Mine workers have been complaining all over the state because a Saturday holiday clause was not included in the last contract and a five-day week adopted. Since the adoption of the contract the miners in Indiana have taken matters into their own hands to a great extent and have laid off on their own accord. The contract provides for a fine in this case, and the operators over the state have been assessing it.

The cases coming before the two organization heads are cases where an appeal is made against the imposition of the fine. Four or five cases a day are being disposed of and in the large majority of cases the fines are being upheld because the miner cannot provide a reasonable excuse for his failure to work on the Saturday in question.

Indiana Holds First-Aid Contest

Thirty Teams Compete in First-Aid Meet, While Twenty Enter Stretcher Drill—The Two Teams Receiving the Highest Rating Will Represent the State in the Contest at Denver Next Fall

THE fifth annual Indiana State First-Aid Meet, which was held at Clinton under the auspices of the Indiana State First-Aid Association on July 5 in conjunction with an Independence Day celebration, proved the fact that Indiana is still intensely interested in first aid. Excepting the international contests to be held by the Bureau of Mines at Denver in September, this meet will in all probability be the largest occurring this year. Other states might well emulate the interest shown by Indiana in the safety movement.

But this state is not doing first-aid work primarily to rival the first-aid men in other states. A whole-hearted

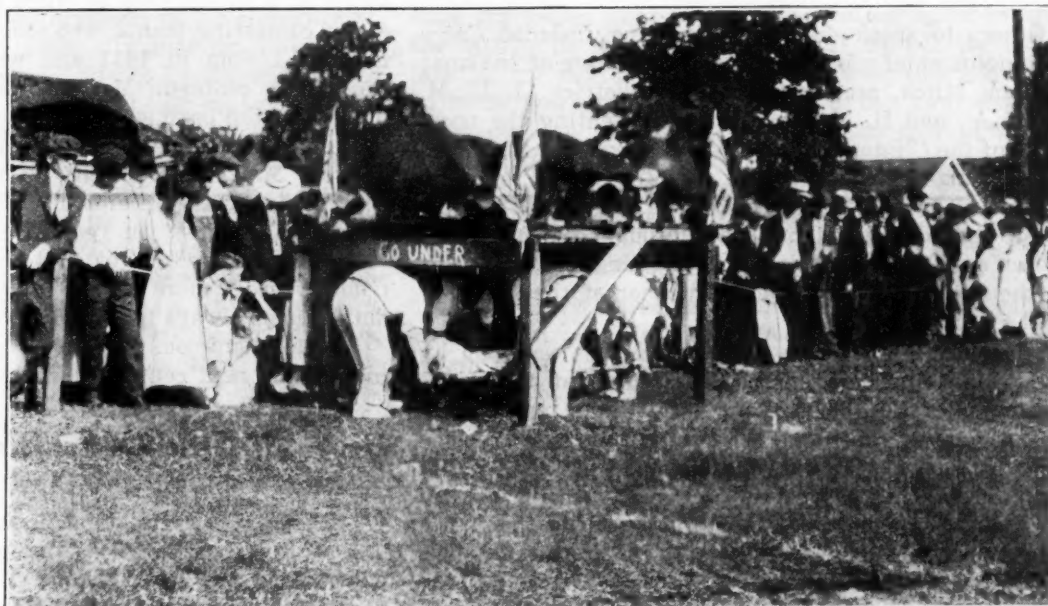
because of the persistence of the rain, only three were actually contested. These were as follows:

1. Right thumb lacerated, blood oozing; simple fracture of middle right arm; compound fracture of left ankle, no bleeding; unconscious. Treat for suffocation. Time, 12 min.
2. Foreign body in right eye, make no attempt to remove. Simple fracture of left collar bone; compound fracture of middle third of right thigh, active bright red hemorrhage; conscious. Patient is in shock. Treat. Time, 15 min.
3. Right foot mangled, active hemorrhage; severe scalp wound on top of head, no hemorrhage; simple fracture of left wrist; unconscious. Patient is in shock. Load on stretcher and carry for 20 ft. Time, 12 min.

Note the second problem, the correct solution of which carries a practical lesson—"Foreign body in right eye." Here is a type of accident that is often

Stretcher Drill

This drill was one of the leading features of the Clinton Meet, yet one that many first-aid contests omit. The team is seen carefully carrying the patient under an obstacle in such a manner as to save him any unnecessary pain from the transportation.



interest in the work in hand is the actuating motive. It was a grim-faced group that assembled after a street parade in the rain on a vacant lot on South Main Street in Clinton for the problems this year. Out of thirty-four teams entered thirty arrived in time to participate in the contest. While the two winning teams were to be sent to Denver in the fall, such rewards appeared to be of secondary importance to the participants, who seemed to be concerned only with the saving of lives.

Approximately one thousand spectators, including many from all points of the state, lined the roped arena and heard the initial gong that started the contest. Rain apparently failed to dampen their ardor, for though the showers continued for an hour and a half, practically all remained for the finish.

The first problem was handed to the team captains at 1.45 p.m. Dr. A. F. Knoefel, a surgeon of Terre Haute and one of the fathers of the first-aid contest in Indiana, acted as chief judge. He was assisted by an able staff of judges drawn from the physicians of Terre Haute; William B. Hice and Frank L. Gilbert, Terre Haute business men, served as recorders, while Donald J. Baker was the announcer.

Five problems were scheduled to be run off, but

encountered, yet how seldom are first-aid teams instructed to meet the emergency! Instead of the team members attempting to remove the body from the eye of the patient, the eye is bandaged untouched. This prevents any infection that might lead to "iritis," that may require months of treatment to prevent blindness.

Some important decisions were made at this meet. One was the adoption of a discount that it is hoped will eventually be universal, while another was the use of a standard type of surgical dressing. In this connection Indiana goes on record as being the first state to hold a meet in which these new standards were followed. The rules of the contest were those adopted by the U. S. Bureau of Mines and set forth in that body's new booklet, "Advanced First-Aid." They are the ones that will prevail at Denver.

When the discounts had been summed up against the teams for the three problems, it was found that several teams were tied, although first and second places were undisputed. Another problem was given the contestants. It was as follows:

Patient lying face downward across live wire, right wrist and left side of chest are on the wire; unconscious, with right wrist burned. Treat. Time, 12 min.

This problem settled all ties.

By this time the rain, which had been coming down steadily, ceased, and the sun broke through the clouds. Twenty teams were entered in the stretcher-drill contest. This was a separate event and similar to the one conducted by the Bureau of Mines for artificial resuscitation. The teams were judged according to bureau standards. Obstacles were placed in the path of the contestants and the men were discounted according to their handling of the patient. The recorders worked in secrecy, and no announcement was made on the field regarding the ultimate standing of the teams. This news was saved as an entertainment feature for the annual banquet held in the evening.

At 6:30 p.m. all team members and meet officials, to the number of 300, assembled in the basement of the First Methodist Church for the annual banquet. M. M. Scott, chairman of the Clinton Chamber of Commerce, was toastmaster. W. D. Ryan, of the Bureau of Mines, was then introduced by Dr. Knoefel and he made a speech praising the work of the mine workers during the war.

Others to speak during the evening included Cairy Littlejohn, chief mine inspector of the State of Indiana; William Mitch, secretary-treasurer, district 11, U. M. W. of A., and H. M. Ferguson, representing the operators of the Clinton district. Vocal music was furnished by a quartette chosen from the diners and by Sam Wilton, deputy mine inspector. At the close of the music and addresses Dr. Knoefel brought the festivities to an end by announcing the standing of the teams in the first-aid contest and the winner of the stretcher drill.

First place in the first-aid competition was won by the team representing the No. 6 mine of the J. K. Dering Coal Co., of Clinton, with a final average of 93½ per cent. With the winning of the meet goes a trip to Denver in the autumn, which the Indiana Bituminous Coal Operators' Association will finance; also the state championship cup, donated by the Lynch Coal Operators' Reciprocal Insurance Association. This team, under the captaincy of Matthew Kerr, has the following personnel: Charles McWethy, Martin Hutchinson, David Wilson, Louis Slatterly and William Reed. Usually there is some dissatisfaction manifested by defeated contestants over the decision of the judges, but there was none of this bad feeling at the Indiana meet. The captain of the team—Mr. Kerr—had already proven, and at a point far removed from the contest, his right to the honor bestowed upon him, for he had been personally responsible some years ago for the saving of a life through artificial respiration at an Indiana catastrophe. Consequently the decision of the judges was well received.

Second place was won by the No. 4 team of the Jackson Hill Coal & Coke Co., of Shelburn. This team also will make the trip to Colorado as guests of District 11, United Mine Workers of America. Personal prizes in the form of gold and blue enameled watch fobs were given each member by *Coal Age*. This team is composed of James Harkess, captain; Rias Brooke, Charles Southwood, William Gregg, Herbert Wence and Clay Meeke. A percentage of 92½ was registered. This shows less than one point of difference between this team and the winners of the meet.

Third place was captured by the team from the No. 8 mine of the Miami Coal Co., of Clinton, with an average of 92 per cent. This team is captained by George

McNair. Each member received an alarm clock besides a watch chain donated by the Clinton First-Aid Association. There were prizes of some sort for all contestants. This was the result of the generosity of Clinton and Terre Haute merchants.

The state championship silver loving cup for the best drilled team in stretcher manipulation was won by the No. 1 team of the Tecumseh Coal & Mining Co., of Bicknell. This team ranked eighth in the first-aid contest. It is captained by Gerald W. Landis. Second place in stretcher drill was captured by a team from the Indiana & Illinois Coal Corporation, of Clinton, which stood sixteenth in the other competition. Third place went to the team from the No. 8 mine of the Miami Coal Co., of Clinton. Here is a team that deserves to be commended, for its standing in both contests was high, being just outside of the big awards. It also won third place in the first-aid meet, as has been previously stated.

Before the men departed Dr. Knoefel announced the award of a safety lamp to Huge Rice, a member of one of the contesting teams, who took part in the first state meet at Linton in 1911 and who has been in every subsequent contest. Mr. Rice was one of three men present at the banquet who had competed in the initial contest. A fine sentiment is displayed in such an award. Mr. Rice's activity in first-aid had not been spurred on by the receipt of prizes, for never had his team finished first, yet year after year he has devoted both time and effort to first-aid training. The coal industry needs more men of his caliber, for devotion to duty cannot always be gaged by the awards received.

By the unanimous vote of all present it was decided to hold the next contest at Bicknell.

Declaring Jurors Were Bribed, Union Seeks New Trial in \$300,000 Arkansas Case

AS THE result of a trial in the U. S. District Court at Fort Smith, Ark., the jury awarded \$300,000 damages to the Pennsylvania Mining Co., the United Mine Workers of America being called on to foot the bill. Now T. W. Davis, a member of the jury, declares that Paul McKennon, of Clarksville, attorney for the plaintiff corporation, promised to see that the jurors would receive more than the \$3 allowed them by law.

McKennon denies Davis' statement and declares that when Davis approached him on the subject he advised him that the matter could only be considered in open court. It is alleged also that E. W. Scott, another juror, who owned an oil lease, met McKennon in the federal building during the trial and asked him whether he could tear down a derrick which the leaseholder had erected and which threatened to fall and kill his cattle. McKennon asked a few questions and told Scott that the leaseholder no longer had a rightful lease, thus without compensation rendering a legal opinion to a juror in a case in which the juror was interested.

Powell is said to have reported that James K. Gearhart, president of the company, declared that three jurors—Mays, Paschal and Vestus Jeffers—visited him and his associates at the hotel and that "they were satisfied." Powell is in California. Gearhart declares that he does not remember making the remark, but that if he made it he meant that the Pennsylvania Mining Co. was satisfied with the verdict. Judge Youmans is considering this testimony as a basis for a new trial.

Defining the Status and Scope of the Executive in Engineering*

Capacity to See Things Constructively and to Command the Support and Confidence of Others Essential to a Big Executive—Commercial Knowledge Indispensable—Resuscitation from War's Ravages Is the Engineer's Work

BY SAMUEL M. VAUCLAIN†
Philadelphia, Pa.

WHAT is an executive? You must find out and definitely determine what an executive may be. An executive is a man who does things; a man who can see his way clearly to accomplish anything that he sees fit to undertake. Therefore we not only have executives in engineering but we have executives in banking and in commercial life. We have executives in Washington in the various branches of the Government, fully capable of looking after any question which may come up, with the fullest confidence in themselves, and can therefore be given credit for being real executives. But executives are not always big men, because the world is full of executives. No executive can be an executive of huge dimensions unless he has an army of minor executives supporting him who believe in him and his capacity to point the way for them to follow, and each in turn exact with promptness, decision and creditableness that share of the total work which may be assigned to him or to a department which may be under him. I do not think that I can give you any clearer idea of my conception of an executive than to say that he is one who can command. In other words, he must be able to command the support of other men. The man who undertakes to do everything himself is sure to fail. The man who is an executive decides to do as little as possible himself, and if he does that he is sure to succeed.

THE DEFINITION OF AN ENGINEER

We will now turn to the engineer. What is an engineer? Is an engineer a man who plods away patiently at a drawing board to produce a design of some machine, of some engineering problem, perhaps a railway proposition or a tunnel, either through a mountain or under a river; a great bridge, a steamship, a locomotive, or even a wheelbarrow? Is he an engineer, or is he simply a draughtsman? Is he a toiler? Is he a man sufficiently educated to transfer to paper the ideas of others and under instructions to produce something that will guide the average workman in its construction? I do not regard men with those qualifications as engineers.

An engineer is a man who can see things, who is constructive in his thoughts, who can impart this knowledge to others, who can work not only one man on a drawing board but twenty men at drawing boards, and who can pass his ideas to them in a manner so satisfactory that they can be easily grasped. When these details are assembled from the many draughtsmen who are employed you have a great and a successful machine;

you have a great or a successful proposition for building a railroad, for building a tunnel or a bridge; and on the number of men that such an engineer has got to handle depends the rapidity with which this project can be put before the people to whom it must be submitted before it can be constructed; because all engineers, such as we are, before we can do anything must have the money bags in our organization agree to find the cash to do it with. Therefore if we get the right idea of an engineer, an engineer who can not only conceive how things shall be done but can instruct assistants and subordinates clearly and thoroughly in such a manner that they can grasp his ideas and make them of record, then we can easily proceed to a short discussion of the executive in engineering.

IMPORTANCE OF THE COMMERCIAL FEATURE

The true executive in engineering usually is called an optimist. It is very pleasant to be called an optimist. I have been referred to for years as an optimist. Now I am far from an optimist. I simply believe not so much in myself but in the other fellow. I have confidence in the engineers of this country. I have confidence in the engineers of Europe. I believe that these engineers can do things quite as well as I can, and perhaps a little better, so far as the scheming out of any particular contrivance may be concerned. But even should they not be capable of doing such, I feel that it is my duty to permit those men to enjoy and see successfully produced the results of their engineering skill, of their engineering knowledge, and not to undertake to change their views by substituting views of my own which would be counted as being even as good, perhaps far worse, after they have been put in actual practice.

MISTAKES OF SELF-APPOINTED EXECUTIVES

The executive in engineering has another thing to deal with, and that is the commercial side of engineering. To be an executive in engineering regardless of the pocketbook is a simple matter. We have had illustrations of this sort of executive ability during the two years that we were at war with Germany. Those of us who spent the entire time in Washington and who were sufficiently wise to mind their own business and do as their superior officers here—the tried and competent engineers in the Government service—had an opportunity to observe the many mistakes that were made by men who came from the private walks of life and who in a short time imagined they were executives in engineering, and that they could dictate to and advise those who had served years of apprenticeship in this particular type of engineering, and who were,

*Address delivered under the title "The Executive in Engineering" at the organizing conference of the Federated American Engineering Societies, Washington, D. C., June 4, 1920.

†President Baldwin Locomotive Works.

in the judgment of those who were willing to think so, wholly competent for the demands that the Nation must make upon them.

The true executive in engineering hates nothing more than he hates red tape. The man who must get through, who sees the point here and his goal yonder—if he is a true executive—knows that a straight line is the shortest distance between two points. And notwithstanding legal restrictions and Government restrictions during the war, those men, men of courage, executives in engineering, put the ball of red tape in the closet and struck the line, and we who followed, we who are here to serve and to do as we are told, here to be subordinates to these men and give them the advantage of our executive ability in the engineering entrusted to us, can testify to it, and also can testify to their greatness.

If you want to be successful in engineering, do as the shoemaker does, stick to your last, and don't attempt to do all the engineering in the world. If you are an electrical engineer, be an electrical engineer, and become an executive in electrical engineering. If you are an engineer in any other branch of industry, apply yourself to that, because, if you scatter your brains over all the various engineering problems of the country, you will spread out like a drop of water on a pane of glass and, I am afraid, never amount to very much. Concentration in engineering is just as desirable and necessary as concentration in any other business that you may engage in.

GREATER CAUSE FOR WORK THAN DURING WAR

You may be an engineer, but you must be a practical engineer. You may be an executive, but you must be a practical executive. The commercial side of the engineering problem must be considered, and a man cannot be a true executive in engineering unless he gives immediate consideration to the commercial side of this problem, and that is the task that I have given most attention to.

Now, in this day, with you gentlemen more than any others in the United States, the war—that is, the real fighting war we have had, where we have been shooting at each other once in awhile—is over. The worst has happened. There is no cause to worry any more. But there is cause and necessity now to work more than there ever was. The whole world must be taught to work, and the work that is to be done is engineering work. And we here in America must not only work as engineers and as executives—executives in engineering—but also as executives in engineering from a commercial standpoint.

The devastated countries of Europe must be rehabilitated, and we can talk about sending millions and millions and millions of dollars worth of food and supplies to the devastated sections of Europe for their relief, but that will never relieve them. They must have the engineer there. They must have the executive there to advise these people and, more than that, they must have both of them there in a commercial sense. They must teach these people and show these people how to utilize those things which are in the nation to enable them themselves to go to work and by their own hands earn a livelihood, to relieve themselves from the necessity of charity, to earn their own food, to make their own clothes, to attend to their own wants in every respect. It must be accomplished through America and

through the engineering profession of America, because the engineering profession of America is really the manufacturing element of America.

I made up my mind that something had to be done several months ago, and instead of sending my boy around I went myself to find out what was necessary, and I found out we must lend these people not money but manufactured articles and raw materials with which to repair the machinery which they now have and which they need so badly, and we must give them time to pay for it. We must find some way in this country to get credit for ourselves, not for these people abroad but credit for ourselves, so that we can lend our manufactures to these people. This procedure is going to require the greatest skill from the standpoint of an executive in engineering, and he must be guided by commercial difficulties, by commercial necessities and by the commercial requirements of these people.

ADVOCATES BATTERING WITHOUT MONEY

Forget about the money. The money in states such as Roumania is not worth much more than firewood today. The price of fuel oil, as you know, has advanced thirteen cents a gallon. When you use fuel oil in France today it is like using up German marks or Roumanian leu. And therefore the oil in Roumania is as good as the oil in the United States. The wood of Roumania is as good as the wood of the United States. The lumber in Roumania is the finest in the world. As fine salt as is found in Roumania is not found in any other part of the world, nor is it as cheaply mined as it is in the salt mines in Roumania.

When William Penn came to Philadelphia, instead of offering the Indians money he brought them beads and jewelry and fine linens for their squaws, and was very successful in negotiating for land. And one of these quiet Philadelphians went to Roumania and sold Roumania locomotives for oil. Why not oil? Oil is just as good as money. It is barter, I agree with you; but money is a sort of a barter. But oil is more reliable than money, because oil is always oil and money is not always money.

EUROPE IN NEED OF MACHINE TOOLS AND PUMPS

Now I am not going to tell you just how to do it; but if you want to do it, if you will come up to Philadelphia I will give you a pointer or two; I will tell you. But I am sure if you go over there to sell machine tools and pumping apparatus, electrical machinery, oil machinery—and they need hundreds of thousands of dollars worth of oil machinery, because the Germans shot theirs all to pieces—you must do it not for money—they haven't got any—but for barter. Sell it for glass beads if necessary. Glass beads are worth something in this country, and the freight on glass beads is no more than on anything else. But barter with these countries which have such a depreciated currency. Barter is the way to do business. And therefore we need an executive in engineering who is selling the product of his brain and his factory upon a commercial basis that is suitable to a country that has no money; and if he can educate himself as to how to do it, not only will he be successful and the United States be successful but the people on the other side of the water will be helped tenfold more than they will by any means of supplying them food and clothing without work, that could be conceived in this country.



Discussion by Readers

Edited by
James T. Beard

What a Certificate of Competency Means in Scotland

CERTIFICATES of competency are not to be bought in Scotland, as was intimated by a writer in *Coal Age* not long since. I heartily agree with the suggestion of J. H. McMillan, in the issue, March 18, p. 556, where he says that such a thing is absurd and adds that the holder of a certificate of competency in Scotland, has always obtained it through his own individual efforts.

Any statement that reflects on the efficiency of Scotch mine managers is false and without foundation. Most of the mine managers in that country are trained men who have worked their way up from the bottom and understand the work of mining coal and the operation of a mine in all its branches. Only their own ability and earnestness to improve their condition has enabled those men to procure the certificates they hold.

Anyone who will examine the list of questions asked at any mining examination held at Edinburgh, will be convinced that the men who pass such an examination are capable of filling the office of mine manager. They are all-round capable men. I state this in the belief that it will enlighten some American mine foremen who are frequently led to underrate the mining ability of Scotchmen. Much more could be said along that line, but this should be sufficient.

TOM JOHNSTONE.

Pa.

Advantage of Building Overcasts

READING the inquiry of a Pennsylvania superintendent, regarding the proper ventilation of a mine, a plan of which he submitted in *Coal Age*, May 27, p. 1109, has reminded me of a suggestion made recently in these columns, that overcasts ought to be constructed so as to cut out the use of doors wherever practicable. The reply made to the inquiry showed an excellent plan of ventilation, using overcasts and regulators at the mouth of each pair of cross-entries.

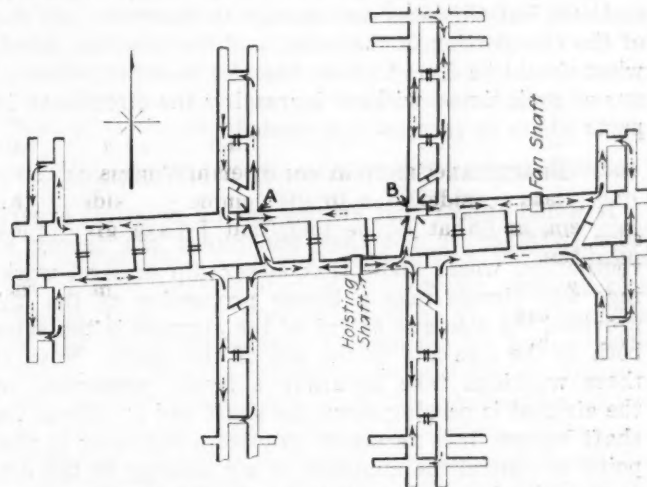
While it is true an overcast should not be built until the development of the cross-entries is sufficient to warrant the expense of its construction, it will generally be found that the saving in ventilating power alone, to say nothing of the more efficient ventilation secured together with the elimination of the annoyance and cost for repairs due to doors on the haulage road, will more than cover the expense of the overcast.

In this connection, I want to submit a plan of one mine that is ventilated by a continuous current and is badly in need of at least two overcasts. These I suggest should be constructed at the points marked A and B in the figure, at the mouth of the two pairs of north entries on the west side of the shaft. At this mine, the main entries were not driven directly east and west, but run about five degrees north of east and to the south of west. In order to square up the work with the boundary line, the first butt-headings were driven at varying

distances from the main entries, leaving seven or eight rooms on the first pair of entries and about nine or ten rooms on the second pair of entries. For the same reason, on the south side of the mine the first butt-headings were driven at distances such as to allow for seven or eight rooms on the first-pair of entries and six or seven rooms on the second pair of entries.

In the plan shown, the light dotted arrows indicate the direction of the present air currents, while the heavy full arrows indicate the circulation of the air after the proposed overcasts are built at A and B. From the viewpoint of economy and efficiency, the building of these overcasts would be of great advantage, in my opinion, particularly as the mine is very gassy and is ventilated by a good blower fan, which would make it possible to change the circulation in the manner suggested.

In the present system, it will be observed that the hoisting shaft is the upcast, which means that haulage is being performed on the return air current. I would suggest that this plan be changed and the fan made to



PLAN SHOWING PRESENT AND PROPOSED CIRCULATIONS

exhaust the air from the mine, thus making the hoisting shaft the downcast and the haulage road the intake airway, as I have indicated by the heavy arrows showing the proposed course of the ventilating current.

Another season will mean a greater development in this mine, and the increased difference between the outside and inside temperatures, in the winter, will undoubtedly increase the danger in the mine and make it all the more important to change the system of ventilation in the manner proposed. The erection of each overcast will have the further advantage of cutting out two doors, one on the main entry and the other on the crosscut. These doors would be taken out as they will be no longer needed after the overcasts are built.

One other condition should also be considered; namely, the improvement that such a change would make in the mine. The men would be more satisfied and there would

be less difficulty in holding them during the dull season. It is always an advantage to keep a satisfied lot of men working in a mine, which will insure a steady output of coal and lessen the chance of labor troubles.

In closing, let me say that most of us have learned some costly lessons in regard to trapdoors being carelessly set open, and causing accidents by reason of a local explosion of gas accumulated in the rooms if, fortunately, it did not result in a mine explosion causing loss of life and destruction of property. The suggestion has been made that firebosses were a necessary evil; but it is certainly true that trapdoors are more often a necessary evil, which can be eliminated by the building of overcasts.

W. H. LUXTON.

Linton, Ind.

Regulating the Distribution of Air in Rise Workings in Mines

RECENTLY, a question was presented in an inquiry on the subject of "Removing Gas from Rise Workings," *Coal Age*, May 13, p. 1013, which it was claimed had been asked at a recent mine foreman's examination. That being so, the question was probably intended to test the candidates' actual knowledge or experience in the practical ventilation of mines.

The question assumed a large gob area to the rise of the air shaft where gas was generated, during periods of falling barometer, in such quantities as to foul the air in the rise workings. In this mine, it was said, a half-inch water gage gave all the air required in other sections, but this was not enough to clear the gas out of the rise portion of the mine; and the question asked, what should be done to keep the rise workings clear of gas at such times, without increasing the circulation in parts where no increase was needed.

PRACTICAL VENTILATION OF DIP WORKINGS

It would appear that anyone having practical experience, whether or not they understood the theory of ventilation, would know that either dip or level workings will always take a larger proportion of the air, provided the size and extent of the airways is the same both to the rise and to the dip of the shaft. Now, if those workings take naturally a larger proportion of the air that is passing down the shaft and is split at the shaft bottom, it is necessary to place a regulator at that point to control the quantity of air passing to the dip, as was plainly stated in the reply to this inquiry.

The effect of thus controlling the flow of air to the dip will be to increase the quantity passing to the rise. The regulator will also increase both the mine resistance and the pressure required to produce the circulation. But, for the same power applied to the fan shaft, the total quantity of air in circulation will be decreased, owing to the increase of pressure caused by the regulator.

During a period of falling barometer there will naturally be an increase of gas given off in the rise workings, especially if these contain a considerable gob area. This increase of gas to the rise must be taken care of by regulating the distribution of the air by changing the regulator so as to give more air to the rise and less to the dip.

However, if there is a similar increase of gas in the dip workings, due to the fall of the barometer, it may be necessary to speed up the fan. But, if the trouble is in the rise workings only, the increase in the percentage

of gas can be regulated by moving the slide in the regulator at the foot of the shaft, so as to give a larger proportion of air in the rise workings.

As stated in the reply to this inquiry, any needed distribution of air between the rise and dip workings in a mine is controlled by the proper adjustment of the regulator, and this must always be made to comply with the conditions existing in the several sections of the mine.

ANDREW O. BAIN.

McKeesport, Pa.

Why Does Promotion So Often Go Where It Is Not Earned

PROMOTION is the cherished goal of every ambitious worker. The gaining of promotion is, therefore, a subject that appeals to every man of intelligence and energy. The truly ambitious man is desirous to learn and grow by experience, in whatever industry he may be employed, and this is particularly true in coal mining practice and requirements.

One cannot fail to appreciate what it costs the ambitious miner to make the necessary effort to fit himself for promotion and, at the same time, perform his daily duties faithfully and in a manner to give satisfaction to his employers. Such a one well deserves promotion when opportunity offers and a place is open for which he has striven hard to prepare himself and is now competent to fill. How often it happens, however, that another man, perhaps fifty per cent proficient, is appointed to the place and the deserving one not recognized. Well may we ask the question, Why is this true? Why does not the promotion go where it has been earned?

Daily experience and observation in mines proves there are many men who study hard to prepare themselves for better work or fit themselves for higher positions only to be disappointed. They study the various subjects relating to mines; train themselves in the handling of men; look carefully after the welfare and safety of the workers in their charge; and in many other ways make themselves competent to assume greater responsibilities.

WHAT A SUCCESSFUL CANDIDATE IN EXAMINATION MUST OFTEN EXPECT

Having passed the examination required and having received a certificate of competency from the Board of Examiners, let me ask, Is not a man then assured of promotion when a vacancy occurs in the position he has desired? In nine cases out of ten I fear the answer to this question is, No! and we ask, Why?

There are many reasons why the promotion so generally goes to another man who is often less fitted for the position. In the first place, the official who has the power to appoint a man for the place may have another in view, and some trifling excuse is given for the selection, which is often due to sect, denomination, membership in a secret order, politics or other outside influence. The pressure brought to bear on appointments, from outside sources too often prevails.

In view of these facts, one is led to wonder, when seeking promotion of a higher official, if he is to be trusted. There are, I am glad to say, men who can be trusted although they form perhaps not 50 per cent of our mine officials. Many officials hold their positions by reason of their dogmatic way of handling men.

Others have a pull with the management, are good talkers and can hold their own in an argument by pulling the wool over the eyes of an employer when that is necessary for their own protection.

An instance, not uncommon in coal-mining practice, was given in a recent letter published in *Coal Age*. It told of a mine foreman who was let out in order to make room for a new superintendent's friend. Everything went along all right for awhile when, to the amazement of the officials, there was a continuous decrease in the daily tonnage of the mine. What was the trouble? Investigation showed that the discharged foreman had made developments providing for future tonnage, and this had enabled the new foreman to make a good showing as long as that lasted.

The new foreman had not the same foresight to provide for the future, however, and there naturally resulted a falling off of the tonnage, which showed the incompetency of the man who was given the place through the friendship of the superintendent. A new superintendent often means a new mine foreman, and other new men all down the line.

SOUND ADVICE TO WORKERS AND TO ALL OFFICIALS ALIKE

Notwithstanding this unpromising outlook, I want to say to the ambitious worker, Be faithful to your employers; never betray a confidence and trust placed in you; do your duty always, although it may seem hard at times, but be sure your opportunity will come; look up and do not be discouraged. Success and happiness rest mainly on the improvement of small opportunities. Let us remember that the kind, unselfish deeds of men are their most enduring monument. Therefore, cherish good deeds; live in your highest thoughts, which like stars will shine brighter when the day of prosperity gives place to the night of adversity.

Let me add, in closing, one of our greatest hindrances in life is the desire to rule others. Put this desire aside and strive for brotherhood. Forget differences that arouse enmity. Regard neither race, sect or condition other than capability and merit. The man who can do this possesses a great soul and little things do not trouble him. No matter how honest one may be in his conviction that he is right, he is liable to do a fellowman a great wrong by reason of imperfect judgment. Therefore, in the words of Lincoln, "Have charity toward all and malice toward none" and one will not go far wrong.

Fairmont, W. Va.

JOHN E. AMBROSE.

Mutual Confidence the Key to Successful Operation

MUCH that is of interest has been said in regard to the need of co-operation among mine officials; and I have read the letters on this subject with pleasure. However, I am compelled to admit that my thirty years of observation and practice in and around coal mines do not enable me to say that the kind of co-operation needed to insure success exists very largely among mine officials.

What is needed along this line is the co-operation that will tie the cords of confidence about the hearts of men and build up a mining industry that will mean both pleasure and profit to all concerned. This will include among other things the education and training of the children in our mining towns and camps.

Instead of this sort of co-operation, however, it is more common to find mine officials displaying a defiant attitude that keeps the workers at a distance and breeds trouble in the end, although it may seem for the time to be the proper discipline required in the management of large bodies of men. In the heart of every worker there is sure to spring up and grow either a confidence or distrust in the management, according to the treatment he receives. Confidence leads to success, while distrust insures ultimate failure.

We often read of a "modern mining town" and "up-to-date mine;" but when we visit the place, we are frequently impressed with the feeling that something is lacking; namely, the natural confidence of the mine officials in their men and a similar confidence on the part of the men in their employers.

MUTUAL CONFIDENCE THE SUPREME FACTOR

If I may be permitted to say a word here, it would be to bring home to the mind of the reader the fact that a general manager should have confidence in his superintendents; the superintendents the same confidence in their foremen, and the foremen likewise trust their men. Confidence should be in evidence between man and man, all down the line, from the general manager to the door-boy. When you lose confidence in a man you have lost the man. The man who has no confidence in another seldom has any in himself.

While we should not be fault finders, close observation reveals many points that need correction and many mistakes for which we should find a remedy. Too often, mine foremen and firebosses are called before the superintendent to receive a reprimand, or to have their attention called to an error they have made. It may be and often is a trifling matter, a mere oversight on the part of the worker.

LACK OF CONFIDENCE IN THE WORD OF AN HONEST AND FAITHFUL WORKER

Not long ago, I witnessed a fireboss called to the superintendent's office and taken to task for not leaving the date of his examination in a certain working place on his route. The fireboss described the true condition of the place by naming the objects he had observed there. He assured the superintendent that he had actually visited the place and made the examination, as well in that as in all other places in his section. The superintendent replied that the only evidence he would consider was his mark, and if that was not there it was evident he had not examined the place. He said further that he had no confidence in a man that would do such work and promptly discharged him.

Let me ask, Would a banker accuse a clerk of stealing money because he had failed to make the entry in the ledger, though the clerk showed him the money was in the drawer? Certain it is that no business can exist without confidence between man and man. It has been a lifelong rule with me not to work for the man who had no confidence in my word, and if I should lose confidence in one of my men I would discharge him at once.

Confidence then is the key to prosperity, while distrust is the road to failure. There is no efficiency without confidence between employer and employed. To this end, let all mine officials meet with their men once a month and co-operate with them as a means of gaining their confidence, which is so necessary to the success of the work in every branch of the industry.

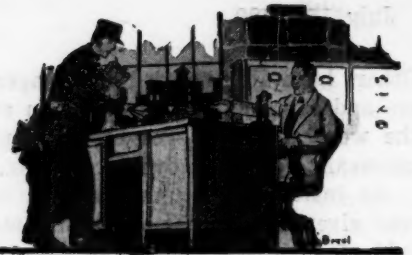
Welch, W. Va.

C. W. ATKINS.



Inquiries of General Interest

Answered by
James T. Beard



Use of Open Lights Allowed Under the Bituminous Mine Law

LATELY, we have had quite an argument here at the mines, regarding Section 3 of Article 10, of the Bituminous Mine Law of this state. I am now enclosing a sketch showing an entry and air course. As indicated by the arrows, the five rooms turned off the entry are ventilated by the return air, which is first conducted to the head of the entries and then made to pass out through the rooms before reaching the main return air-course.

As marked in my sketch, gas is generated at the face of each of the entries. This gas is diluted and carried away by the air current. No gas is generated in the rooms.

In our argument, A claims that it would not be necessary for the miners to use locked safety lamps in rooms 1, 2, 3, 4 and 5, according to the reading of the mine law (Art. 10, Sec. 3). On the other hand, B claims that in order to comply with the law it would be necessary for the workmen to use locked safety lamps in these rooms. I want to ask *Coal Age* and its readers, Who is right?

Article 10, Section 3 of the Bituminous Mine Law of Pennsylvania, relating to the use of open lights in mines generating explosive gas in sufficient quantity to be detected on the flame of an approved safety lamp, reads as follows:

The use of open lights is strictly prohibited in the return air current of any portion of the mine that is ventilated by the same continuous air current that ventilates any other portion of said mine in which locked safety lamps are used. The provisions of this section shall not apply to any mine wherein explosive gas is generated only at the face of active entries.

Kindly explain the meaning of this section.

Pittsburgh Terminal R. R. & Coal Co. FIREBOSS.

The intention of the lawmakers who framed this section was, evidently, to safeguard mines against the use of open lights in a return air current coming from places where gas is generated in quantities sufficient to require the use of locked safety lamps. Unfortunately, the provisions of the section are annulled by its closing sentence, owing to the use of the somewhat indefinite term "active entries."

The accepted meaning of the expression "active entries" will generally be taken as applying to entries that are being driven without regard as to whether any rooms are turned off the entries and are working. In the latter case, however, such entries would be better described as "producing entries."

We cannot understand that the lawmakers had in mind permitting the use of open lights on the return current, in cases where rooms turned off the return

entry are being worked, if gas is generated at the face of the entries in such quantities that locked safety lamps are required by the men driving those entries. In our opinion, the meaning of the law must be taken as prohibiting the use of open lights on the return air current, after that current has passed a place or places requiring the use of locked safety lamps. What do others say?

Theoretical Water Gage Due to the Action of a Fan

THE following question was asked in the first-class examination recently held in Alberta province:

What pressure measured by the water gage should a fan that is theoretically perfect and twelve and one-half feet in diameter make at a speed of 85 r.p.m. when running in a closed space?

I shall esteem it a favor if you will answer this question through the columns of *Coal Age*. It seems to me an indeterminate, theoretical question and, under any circumstances, of little value.

INQUIRER.

Coalhurst, Alberta.

It is customary, in fan practice, to estimate the theoretical water gage produced by the action of a centrifugal fan on the basis that the theoretical head of air column is one-half the head due to the velocity of the blade tips of the fan. Calling the theoretical head, in feet of air column, h , and the velocity of the blade tips, in feet per second, u ; and indicating the force of gravity by $g = 32.16$ ft. per sec., we have for the theoretical head of air due to the action of the fan,

$$h = \frac{u^2}{g}$$

In this case, the blade-tip velocity is $85(3.1416 \times 12.5) \div 60 = 55.64$ ft. per sec. Then, substituting this and the value of the force of gravity in the above formula, we have for the resulting head of air column,

$$h = \frac{55.64^2}{32.16} = 96.25 \text{ ft.}$$

Finally, taking the weight of a cubic foot of air as 0.0766 and multiplying this by the head of air column just found and dividing by 5.2, the pressure per square foot due to one inch of water gage, we have for the theoretical gage due to the action of this fan

$$w. g. = \frac{0.0766 \times 96.25}{5.2} = 1.4, \text{ say } 1\frac{1}{2} \text{ in.}$$

The actual water gage produced will depend primarily, however, on the mine resistance against which the fan operates; and the best results are obtained when the fan is working under conditions that will produce a water gage of about $\frac{1}{2}$ of its theoretical value; or say in this case $\frac{1}{2} \times 1\frac{1}{2} = 1$ in.



Examination Questions

Answered by
James T. Beard



Mine Foremen's Examination Held at Pittsburg, Kan., March 20, 1920

(Selected Questions)

Ques.—What form of an airway will give the most air with the same power, and why?

Ans.—The circular form presents the least rubbing surface for the same sectional area and length of the airway. In other words, for the same length, the ratio of the rubbing surface to the sectional area of a circular airway is less than that of any other form of cross-section. For that reason, the quantity of air circulated by a given pressure or a given power is largest in a circular airway.

However, the circle is not a practical form of cross-section in mining practice. An arched airway will generally pass more air than a square airway; and a square airway will likewise pass more air than one of a rectangular form having the same length and sectional area, under the same power, or pressure.

Ques.—The sectional area of an airway is 48 sq.ft., the total ventilating pressure is 374.4 lb. What would be the water-gage reading?

Ans.—In this case, the unit of ventilating pressure is $374.4 \div 48 = 7.8$ lb. per sq.ft. The corresponding water-gage reading is $7.8 \div 5.2 = 1.5$ inches.

Ques.—Is there an advantage or a loss in having the air travel at a high velocity, and why?

Ans.—There is a large loss in ventilating power when an air current is made to travel at a high velocity. The reason is that the power required to produce the circulation of air in a mine varies with the cube of the velocity of the air current, for the same extent of rubbing surface. Therefore, if the velocity is doubled in a mine, the power required to produce the circulation will be eight times the original power.

Ques.—Which, if either, should be the larger, the main intake or the main return airway, and why?

Ans.—Considering the conditions regarding temperature and pressure, which cause the expansion of the return air current, and the increase in volume by reason of the presence, in the current, of the gases generated in the mine, the return airway should have a larger sectional area than the intake.

Aside from these considerations, however, where haulage is performed on the intake current, as is common in gaseous mines, it may be necessary to make the intake road the larger, for practical reasons. The loaded cars and empty trips passing to and fro on the haulage road form more or less of an obstruction to the flow of the air. Besides, there is the further reason for giving that airway a larger sectional area, so that a sufficient clearance space can be provided at the side of the track to enable men and animals to pass the cars with safety.

Ques.—What is the most economical way to increase the quantity of air in a coal mine? Explain fully.

Ans.—Clean up the airways and remove every obstruction to the passage of the air. Wherever practic-

able, straighten the air-courses and shorten the distance the air must travel, enlarge all breakthroughs or crosscuts and, finally, reduce the mine resistance as much as practicable, by splitting the air current, thereby reducing its velocity and saving the power required for the necessary circulation, or increasing the quantity of air circulated by the same power.

Ques.—In opening a new mine, what would be the essential point to consider in locating and sinking the shaft and laying out the mine workings?

Ans.—Regard must be had to the extent of the property, thickness and inclination of the coal, the character of the surface and the shipping facilities afforded, together with a suitable site for the plant and water supply. The location of the shaft must be such as to avoid any danger from excessive floods, while providing easy loading facilities and opportunity for the necessary cleaning and sizing of the coal, in its preparation for the market. At the same time, due regard must be had for the drainage and ventilation of the mine and the underground haulage, so that both the coal and the water will gravitate to the shaft bottom, as far as this is possible. The location of the shaft should be central in the property, but having due regard to the conditions previously mentioned, the purpose being to establish a minimum length of haul in the development of the mine.

Ques.—State how you would build and erect a trap-door in a coal mine?

Ans.—A trapdoor should not be placed at the foot of a sharp grade, where there is danger of the passing cars not being under safe control. The roof where a door is to be located should be well supported, the sides trimmed and any loose pieces of slate taken down or made secure. A substantial timber frame must then be set so as to make a solid base for the door. The latter must now be hung so as to open against the air and be given a slight fall to enable it to close automatically.

The fall of the door can be arranged by giving its edge, on the hinge side, a slight inclination so that the upper hinge will be an inch or two nearer the center of the entry than the lower hinge. This position of the hinge hangers will cause the door to rise slightly as it opens and fall shut when released. The door must be substantially made of double planks, cut on the bias and securely nailed together to give greater strength to resist sagging. Canvas flaps should be provided around the edges of the door to prevent the leakage of air when the door is closed.

Ques.—What kind of haulage would you recommend to replace animal haulage when a mine has been extensively developed and why?

Ans.—Some form of mechanical haulage, either rope or motor haulage by electric or compressed-air locomotives. The use of either of these types will depend largely on whether the mine is equipped with electricity or compressed air. The former should not be used if the mine is generating much gas.

Wages and Earnings in Anthracite Mines Lag Behind Cost of Living, Declares Jett Lauck in Exhibit 12*

Statistician Argues That Compensation Should Be Given for the Period When Cost of Living Outstripped Wages and That Day and Other Rates Need the Standardization Which They Have Received in the Bituminous Regions

The contract miners form by far the largest single group of employees in the anthracite mines, constituting as they do about 30 per cent of the entire number of employees. The rates of these men vary from colliery to colliery and even from vein to vein. No attempt has ever been made to classify or standardize their rates, and all wage adjustments made since the great strike of 1902 have accepted the old rates as they stood and added thereto a specified percentage increase. Thus rates exist today the bases of which probably were first established twenty years ago or more.

The Table I gives the relative rates since 1902, that is the rates based on the pre-strike rate of 100.

TABLE I. RELATIVE WAGE RATES SINCE 1902

1902 pre-strike.....	100.00
1903.....	114.40
1904.....	114.95
1905.....	114.31
1906.....	114.58
1907.....	114.22
1908.....	114.40
1909.....	114.49
1910.....	114.40
1911.....	114.95
1912 after April.....	121.00
1913.....	121.00
1914.....	121.00
1915.....	121.00
1916 after April.....	129.50
1917 after April.....	142.50
1917 after November.....	161.96
1918 after November.....	181.30
1919.....	181.30
1920 to April.....	181.30

The award of the Anthracite Coal Strike Commission gave these employees a 10-per cent increase in rates. It also provided that for each 5-cent advance in the wholesale price of coal at New York City the miners should have a 1-per cent increase in rate over the new base established by the commission.

This agreement remained in effect nine years. During that time the sliding scale was responsible for increases in rate above the 1902 rate varying from 4.22 per cent in 1907 to 4.95 per cent in 1904 and 1911. The average increase for the nine years was 4.2 per cent. A new agreement was entered into on May 20, 1912. Under this agreement the sliding scale was abolished and in its place was granted an increase of 10 per cent over the rate of 1911. This increased the basic relative from 110, which it had been from 1903 to 1911, to 121.

*Reprint of Exhibit 4, entitled "The Relationship Between Rates of Pay and Earnings and the Cost of Living in the Anthracite Industry of Pennsylvania," presented by Jett Lauck to the Anthracite Coal Commission on behalf of the United Mine Workers of America.

The basic rate for 1911 plus the additional wage received under the sliding scale made the index number for that year 114.95. Therefore the actual in-

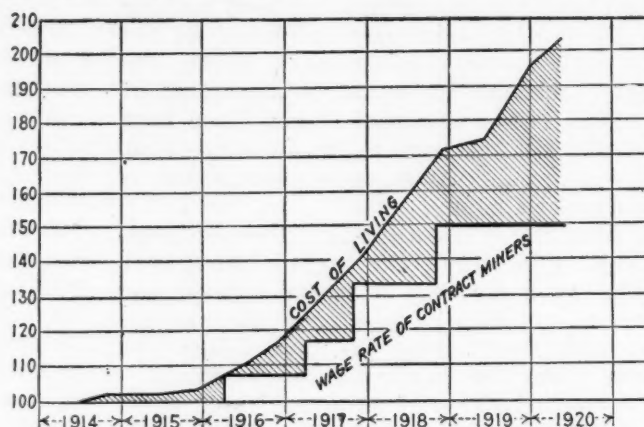


FIG. 1. CONTRASTING LIVING-COST INCREASES WITH THE RISES IN CONTRACT RATES FOR THE MINING OF ANTHRACITE

Both increases are given as percentages of the prices and rates respectively which obtained in 1914. Mr. Lauck argues that the delay in confirming wage rates of contract miners to the cost of living and the inadequate degree to which the confirmation was in each case made caused the contract miners the loss indicated by the shaded area.

crease brought about by the agreement of 1912 was 6.05 points. The wage of 1912 therefore shows an increase of 5.2 per cent over that of 1911, and a total increase of 21 per cent over the pre-strike rate of 1902. On May 5, 1916, a new agreement was entered into under which tonnage rates were raised 7 per cent above the rates in 1915. This made a total increase of 29.5 per cent over the rate of 1902.

THREE ADVANCES SINCE 1916

Since 1916 three new voluntary agreements have been entered into, each of which provided an increase in rates. These increases, however, were given not in the form of rate increases but in the form of additions to gross earnings. Thus the agreement of April 26, 1917, provided for the addition of 10 per cent to the gross earnings of each miner as determined by the agreement of May 5, 1916.

On Nov. 17, 1917, this was superseded by an agreement giving a 25-per cent increase on gross earnings, based on the agreement of 1916. Finally, on Nov. 15, 1918, the percentage bonus was raised to 40 per cent. Under these last three agreements it will be seen that the net increase in miners' rates above the 1902 base has been 42.5, 61.9 and 81.3 per cent.

The agreement of Nov. 15, 1918, according to its terms, was to remain in effect until the declaration of peace,

or until March 31, 1920, if peace was not declared before that day. By a subsequent agreement entered into September 29, 1919, the conditional clause was eliminated and the duration of the agreement until March 31, 1920, made unconditional.

No satisfactory figures exist for changes in the cost of living prior to the studies made by the U. S. Bureau of Labor Statistics. As explained elsewhere, these figures do not go back of the war period, so in order to compare them with the wage rates of contract miners it is necessary to take the rates that existed in 1914 as a base (that is,

as equal to 100) and compute from that the relatives since. These rates are recorded in Table II.

TABLE II. RELATIVE WAGE RATES OF CONTRACT MINERS SINCE 1914

1914.....	100.0
1915.....	100.0
1916 after April.....	107.0
1917 after April.....	117.7
1917 after November.....	133.75
1918 after November.....	149.8
1919.....	149.8
1920 to April.....	149.8

As the cost of living from 1914 up to May, 1920, has risen 104 per cent, while the contract rates have risen only 49.8 per cent, it is evident that the contract miners are not today as well off as they were at the beginning of the war in 1914.

TABLE III. DATA FOR CHART ON RATES OF CONTRACT MINERS AND ON COST OF LIVING

	Wage Rates of Contract Miners Per Cent		Cost of Living Per Cent
1914	100.0	July, 1914	100
		Dec., 1914	102
1915	100.0	June, 1915	102
		Dec., 1915	103
1916 after April	107.0	June, 1916	109
		Dec., 1916	117
1917 after April	117.7	June, 1917	129
1917 after Nov.	133.75	Dec., 1917	141
		June, 1918	156
1918 after Nov.	149.8	Dec., 1918	172
1919	149.8	June, 1919	175
		Dec., 1919	195
1920 to April	149.8	May, 1920	204

This is shown graphically in Fig. 1. In order to restore the rates of the contract miner to the same relationship to the cost of living that was established by the wage adjustment in 1912 it would be necessary to increase the present rates by 36.2 per cent.

SHOULD HAVE \$2.04 PER CAR

A common rate for coal (gangway and airway) in 1914, established in 1912, was close to \$1 per car. This rate, with the subsequent increases, has now become \$1.498, but in order to raise it up to the point where the day's earnings will buy the same necessities of life that they would buy in 1914 it would have to be increased now to \$2.04 per car, an increase amounting, as explained above, to 36.2 per cent.

But simply increasing the rate up to the cost of living at infrequent intervals does not result in even approximate justice to the worker on account of the amount of purchasing power that he has lost in the past through the fact that his earnings have lagged behind the cost of living. As an illustration, assume that the wage is so adjusted at the start of a period that one day's earnings will be sufficient to purchase, say, 100 lb. of flour.

During the period, and before the next adjustment, if flour rises in price 50 per cent, the worker will find that he can purchase with one day's earnings only 66.67 lb. of flour, and that he is obliged to work a day and a half in order to obtain the needed 100 lb. The result must be that he and his family go without something they formerly enjoyed, or else he runs into debt.

When the next wage adjustment comes, even if his rate is increased 50 per cent so that he can once more purchase his 100 lb. of flour with one day's earnings, he is not recompensed for his forced self-denial during the period, nor is he able to pay the debts he has contracted.

LOSS BY ADJUSTMENT DELAY

Another way of expressing this is as follows: At any wage fixation, both parties to the fixation have their attentions focused, consciously or unconsciously, upon the purchasing power of the wage as fixed. The number of dollars is important only as compared with the amount of commodities that may be purchased. At the wage fixation of 1916 (which forms the basis of all subsequent increases) a certain definite purchasing power was given to the mine workers.

It was, of course, the intention that the mine workers should continue to receive this purchasing power. It was decided that they needed at least this purchasing power in order to pay their bills. But, owing to the great increase in prices, the mine workers have not received what the wage fixation decreed they should receive. No one of the subsequent increases has been sufficient even to bring their wage back to the purchasing power fixed in 1916. The result is, then, that the mine workers have actually lost.

The shaded area in Fig. 1 shows the amount that has been lost by the contract miner through this failure of his rate to keep pace with the cost of living. A glance at the chart shows that in April, 1916, the rate was raised just up to the cost of living line, but not above it, so although he could then purchase all that he could in 1914, he was not repaid for his losses already incurred. Since April, 1916, none of the increases has brought the rate within a reasonable distance of the cost of living, and the increase of November, 1918, was notably inadequate.

If we disregard all losses incurred by the miner prior to the increase of November, 1917, we can compute his loss per car by taking any one of the rates and subtracting it from what it should have been in each of the succeeding months. Thus if we take the rate that was \$1 per car in 1914 and is \$1.498 per car now, his losses per car have been for each month as follows:

TABLE IV. LOSS TO CONTRACT MINER PER CAR THROUGH FAILURE OF WAGE RATE TO KEEP PACE WITH THE COST OF LIVING

November, 1917.....	\$0.05
December.....	.07
January, 1918.....	.09
February.....	.12
March.....	.14
April.....	.17
May.....	.19
June.....	.22
July.....	.24
August.....	.27
September.....	.30
October.....	.32
November.....	.35
December.....	.38
January, 1919.....	.41
February.....	.44
March.....	.47
April.....	.49
May.....	.50
June.....	.52
July.....	.54
August.....	.56
September.....	.58
October.....	.60
November.....	.62
December.....	.64
January, 1920.....	.66
February.....	.68
March.....	.70
April.....	.72
May.....	.74
June.....	.76
July.....	.78
August.....	.80
September.....	.82
October.....	.84
November.....	.86
December.....	.88
January, 1921.....	.90
February.....	.92
March.....	.94
April.....	.96
May.....	.98
June.....	1.00
July.....	1.02
August.....	1.04
September.....	1.06
October.....	1.08
November.....	1.10
December.....	1.12
January, 1922.....	1.14
February.....	1.16
March.....	1.18
April.....	1.20
May.....	1.22
June.....	1.24
July.....	1.26
August.....	1.28
September.....	1.30
October.....	1.32
November.....	1.34
December.....	1.36
January, 1923.....	1.38
February.....	1.40
March.....	1.42
April.....	1.44
May.....	1.46
June.....	1.48
July.....	1.50
August.....	1.52
September.....	1.54
October.....	1.56
November.....	1.58
December.....	1.60
January, 1924.....	1.62
February.....	1.64
March.....	1.66
April.....	1.68
May.....	1.70
June.....	1.72
July.....	1.74
August.....	1.76
September.....	1.78
October.....	1.80
November.....	1.82
December.....	1.84
January, 1925.....	1.86
February.....	1.88
March.....	1.90
April.....	1.92
May.....	1.94
June.....	1.96
July.....	1.98
August.....	2.00
September.....	2.02
October.....	2.04
November.....	2.06
December.....	2.08
January, 1926.....	2.10
February.....	2.12
March.....	2.14
April.....	2.16
May.....	2.18
June.....	2.20
July.....	2.22
August.....	2.24
September.....	2.26
October.....	2.28
November.....	2.30
December.....	2.32
January, 1927.....	2.34
February.....	2.36
March.....	2.38
April.....	2.40
May.....	2.42
June.....	2.44
July.....	2.46
August.....	2.48
September.....	2.50
October.....	2.52
November.....	2.54
December.....	2.56
January, 1928.....	2.58
February.....	2.60
March.....	2.62
April.....	2.64
May.....	2.66
June.....	2.68
July.....	2.70
August.....	2.72
September.....	2.74
October.....	2.76
November.....	2.78
December.....	2.80
January, 1929.....	2.82
February.....	2.84
March.....	2.86
April.....	2.88
May.....	2.90
June.....	2.92
July.....	2.94
August.....	2.96
September.....	2.98
October.....	3.00
November.....	3.02
December.....	3.04
January, 1930.....	3.06
February.....	3.08
March.....	3.10
April.....	3.12
May.....	3.14
June.....	3.16
July.....	3.18
August.....	3.20
September.....	3.22
October.....	3.24
November.....	3.26
December.....	3.28
January, 1931.....	3.30
February.....	3.32
March.....	3.34
April.....	3.36
May.....	3.38
June.....	3.40
July.....	3.42
August.....	3.44
September.....	3.46
October.....	3.48
November.....	3.50
December.....	3.52
January, 1932.....	3.54
February.....	3.56
March.....	3.58
April.....	3.60
May.....	3.62
June.....	3.64
July.....	3.66
August.....	3.68
September.....	3.70
October.....	3.72
November.....	3.74
December.....	3.76
January, 1933.....	3.78
February.....	3.80
March.....	3.82
April.....	3.84
May.....	3.86
June.....	3.88
July.....	3.90
August.....	3.92
September.....	3.94
October.....	3.96
November.....	3.98
December.....	4.00
January, 1934.....	4.02
February.....	4.04
March.....	4.06
April.....	4.08
May.....	4.10
June.....	4.12
July.....	4.14
August.....	4.16
September.....	4.18
October.....	4.20
November.....	4.22
December.....	4.24
January, 1935.....	4.26
February.....	4.28
March.....	4.30
April.....	4.32
May.....	4.34
June.....	4.36
July.....	4.38
August.....	4.40
September.....	4.42
October.....	4.44
November.....	4.46
December.....	4.48
January, 1936.....	4.50
February.....	4.52
March.....	4.54
April.....	4.56
May.....	4.58
June.....	4.60
July.....	4.62
August.....	4.64
September.....	4.66
October.....	4.68
November.....	4.70
December.....	4.72
January, 1937.....	4.74
February.....	4.76
March.....	4.78
April.....	4.80
May.....	4.82
June.....	4.84
July.....	4.86
August.....	4.88
September.....	4.90
October.....	4.92
November.....	4.94
December.....	4.96
January, 1938.....	4.98
February.....	5.00
March.....	5.02
April.....	5.04
May.....	5.06
June.....	5.08
July.....	5.10
August.....	5.12
September.....	5.14
October.....	5.16
November.....	5.18
December.....	5.20
January, 1939.....	5.22
February.....	5.24
March.....	5.26
April.....	5.28
May.....	5.30
June.....	5.32
July.....	5.34
August.....	5.36
September.....	5.38
October.....	5.40
November.....	5.42
December.....	5.44
January, 1940.....	5.46
February.....	5.48
March.....	5.50
April.....	5.52
May.....	5.54
June.....	5.56
July.....	5.58
August.....	5.60
September.....	5.62
October.....	5.64
November.....	5.66
December.....	5.68
January, 1941.....	5.70
February.....	5.72
March.....	5.74
April.....	5.76
May.....	5.78
June.....	5.80
July.....	5.82
August.....	5.84
September.....	5.86
October.....	5.88
November.....	5.90
December.....	5.92
January, 1942.....	5.94
February.....	5.96
March.....	5.98
April.....	6.00
May.....	6.02
June.....	6.04
July.....	6.06
August.....	6.08
September.....	6.10
October.....	6.12
November.....	6.14
December.....	6.16
January, 1943.....	6.18
February.....	6.20
March.....	6.22
April.....	6.24
May.....	6.26
June.....	6.28
July.....	6.30
August.....	6.32
September.....	6.34
October.....	6.36
November.....	6.38
December.....	6.40
January, 1944.....	6.42
February.....	6.44
March.....	6.46
April.....	6.48
May.....	6.50
June.....	6.52
July.....	6.54
August.....	6.56
September.....	6.58
October.....	6.60
November.....	6.62
December.....	6.64
January, 1945.....	6.66
February.....	6.68
March.....	6.70
April.....	6.72
May.....	6.74
June.....	6.76
July.....	6.78
August.....	6.80
September.....	6.82
October.....	6.84
November.....	6.86
December.....	6.88
January, 1946.....	6.90
February.....	6.92
March.....	6.94
April.....	6.96
May.....	6.98
June.....	7.00
July.....	7.02
August.....	7.04
September.....	7.06
October.....	7.08
November.....	7.10
December.....	7.12
January, 1947.....	7.14
February.....	7.16
March.....	7.18
April.....	7.20
May.....	7.22
June.....	7.24
July.....	7.26
August.....	7.28
September.....	7.30
October.....	7.32
November.....	7.34
December.....	7.36
January, 1948.....	7.38
February.....	7.40
March.....	7.42
April.....	7.44
May.....	7.46
June.....	7.48
July.....	7.50
August.....	7.52
September.....	7.54
October.....	7.56
November.....	7.58
December.....	7.60
January, 1949.....	7.62
February.....	7.64
March.....	7.66
April.....	7.68
May.....	7.70
June.....	7.72
July.....	7.74
August.....	7.76
September.....	7.78
October.....	7.80
November.....	7.82
December.....	7.84
January, 1950.....	7.86
February.....	7.88
March.....	7.90
April.....	7.92
May.....	7.94
June.....	7.96
July.....	7.98
August.....	8.00
September.....	8.02
October.....	8.04
November.....	8.06
December.....	8.08
January, 1951.....	8.10
February.....	8.12
March.....	8.14
April.....	8.16
May.....	8.18
June.....	8.20
July.....	8.22
August.....	8.24
September.....	8.26
October.....	8.28
November.....	8.30
December.....	8.32
January, 1952.....	8.34
February.....	8.36
March.....	8.38
April.....	8.40
May.....	8.42
June.....	8.44
July.....	8.46
August.....	8.48
September.....	8.50
October.....	8.52
November.....	8.54
December.....	8.56
January, 1953.....	8.58
February.....	8.60
March.....	8.62
April.....	8.64
May.....	8.66
June.....	8.68
July.....	8.70
August.....	8.72
September.....	8.74
October.....	8.76
November.....	8.78
December.....	8.80
January, 1954.....	8.82
February.....	8.84
March.....	8.86
April.....	8.88
May.....	8.90
June.....	8.92
July.....	8.94
August.....	8.96
September.....	8.98
October.....	9.00
November.....	9.02
December.....	9.04
January, 1955.....	9.06
February.....	9.08
March.....	9.10
April.....	9.12
May.....	9.14
June.....	9.16
July.....	9.18
August.....	9.20
September.....	9.22
October.....	9.24
November.....	9.26
December.....	9.28
January, 1956.....	9.30
February.....	9.32
March.....	9.34
April.....	9.36
May.....	9.38
June.....	9.40
July.....	9.42
August.....	9.44
September.....	9.46
October.....	9.48
November.....	9.50
December.....	9.52
January, 1957.....	9.54
February.....	9.56
March.....	9.58
April.....	9.60
May.....	9.62
June.....	9.64
July.....	9.66
August.....	9.68
September.....	9.70
October.....	9.72
November.....	9.74
December.....	9.76
January, 1958.....	9.78
February.....	9.80
March.....	9.82
April.....	9.84
May.....	9.86
June.....	9.88
July.....	9.90
August.....	9.92
September.....	9.94
October.....	9.96
November.....	9.98
December.....	10.00
January, 1959.....	10.02
February.....	10.04
March.....	10.06
April.....	10.08
May.....	10.10
June.....	10.12
July.....	10.14
August.....	10.16
September.....	10.18
October.....	10.20
November.....	10.22
December.....	10.24
January, 1960.....	10.26
February.....	10.28
March.....	10.30
April.....	10.32
May.....	10.34
June.....	10.36
July.....	10.38
August.....	10.40
September.....	10.42
October.....	10.44
November.....	10.46
December.....	10.48
January, 1961.....	10.50
February.....	10.52
March.....	10.54
April.....	10.56
May.....	10.58
June.....	10.60
July.....	10.62
August.....	10.64
September.....	10.66
October.....	10.68
November.....	10.70
December.....	10.72
January, 1962.....	10.74
February.....	10.76
March.....	10.78
April.....	10.80
May.....	10.82
June.....	10.84
July.....	10.86
August.....	10.88
September.....	10.90
October.....	10.92
November.....	10.94
December.....	10.96
January, 1963.....	10.98
February.....	11.00
March.....	11.02
April.....	11.04
May.....	11.06
June.....	11.08
July.....	11.10
August.....	11.12
September.....	11.14
October.....	11.16
November.....	11.18
December.....	11.20
January, 1964.....	11.22
February.....	11.24
March.....	11.26
April.....	11.28
May.....	11.30
June.....	11.32
July.....	11.34
August.....	11.36
September.....	11.38
October.....	11.40
November.....	11.42
December.....	11.44
January, 1965.....	11.46
February.....	11.48
March.....	11.50
April.....	11.52
May.....	11.54
June.....	11.56
July.....	11.58
August.....	11.60
September.....	11.62
October.....	11.64
November.....	11.66
December.....	11.68
January, 1966.....	11.70
February.....	11.72
March.....	11.74
April.....	11.76
May.....	11.78
June.....	11.80
July.....	11.82
August.....	11.84
September.....	11.86
October.....	11.88
November.....	11.90
December.....	11.92
January, 1967.....	11.94
February.....	11.96
March.....	11.98
April.....	12.00
May.....	12.02
June.....	12.04
July.....	12.06
August.....	12.08
September.....	12.10
October.....	12.12
November.....	12.14
December.....	12.16
January, 1968	

TABLE VI. AVERAGE NUMBER OF WAGE EARNERS

	1912	1911	1910	1909	1908
Miners.....	42,201	44,290	42,897	43,343	43,482
Miners—laborers.....	33,292	32,691	32,536	32,778	38,896
Other inside—men.....	48,024	46,784	44,750	46,034	45,485
Other inside—boys.....	7	201	5	315	160
Outside—men.....	29,554	28,082	28,092	27,217	27,323
Outside—boys.....	135	1,310	1,044	2,794	3,432
Breaker employees.....	16,238	16,271	16,310	16,855	17,600
Totals.....	170,451	169,629	165,634	169,336	176,377

are extremely numerous, each company, and even each colliery, having its own set of rates which differs from all other sets of rates in effect elsewhere. To show the variation in rates among men engaged in practically identical work Table VII has been prepared, giving the rates in effect after the application of the November, 1918, increase, for the principal occupations in the larger collieries of District 1.

Table VII illustrates at once the great need of some standardization of rates within the industry and also the practicability of such standardization. The ashmen, to take a single instance, have an average rate of \$3.61 per day, and this also is the rate at four out of the eight collieries. Manifestly, inasmuch as all are performing the same work, all should be brought to one rate.

While there may be considerable difference between the work of a miner in the anthracite field and the work of a miner in the bituminous field, there is no great difference between the two industries in the work of the miscellaneous men—that is, of the day men employed at such occupations as blacksmiths, bratticemen, trackmen, engineers, firemen, carpenters, laborers and the like. The bituminous industry has for some years standardized its employees within broad areas, fixing rates effectively for all blacksmiths, for all engineers, for all trackmen and so forth.

STANDARDIZATION FEASIBLE

It is evident that if this was possible in the bituminous industry it is trebly possible in the anthracite industry, because here (1) the geographical area covered is smaller, insuring greater uniformity of living conditions, competing wage rates of other industries and prices of commodities; (2) the control of the anthracite industry is much more highly concentrated than the control of the bituminous industry; (3) the working conditions of the different collieries are more nearly similar each to each than is the case in the bituminous industry.

The increase that these miscellaneous occupations have received since 1912 has been greater than the increase that took place in the cost of living; though even so their present rates are below what they should be for the maintenance of a proper standard. Of course this is because the rates they received before 1912 were so fearfully inadequate that even with the comparatively large increases they are not receiving a living wage.

Table VIII gives the daily wage for inside and outside day labor for district

7, in effect in April, 1912, and in November, 1918.

The increase in per cent since the 1912 rate has been 81.1 for the day wage miner and 175.9 per cent for semi-skilled outside labor. The inside workers have not in general received quite the increase in the cost of living (which has been about 100 per cent or a little more) but they have very nearly done so. The outside workers, on the other hand, have received considerably in excess of this cost of living increase.

In more detail Table IX shows the increases received in the more important occupations of the collieries of district 1 and 9.

It will be noticed that in Table X and in Table VIII the inside workers and the higher-paid outside workers received an increase averaging a little over \$2 per day, while the lower-paid outside workers received an increase averaging only about \$1.85 per day. In spite of this difference in the amounts of the increase, the lower-paid workers figure out a larger per cent increase because the \$1.85 forms a larger proportion of their former wage than the \$2 of the higher-paid men forms of theirs.

It might well be urged that clothing,

food and other necessities have advanced as much more for the lower-paid men as for the higher, and that therefore all should receive the same flat increase, but in addition to that something is due the lower paid men as recompense for losses during the past few years, and this is true in spite of the fact that their percentage increases have been greater than the percentage increases of the cost of living.

TABLE IX. COMPARISON OF DAY WAGES IN DISTRICTS 1 AND 9, AFTER APRIL, 1912

	District 1	District 9
Company miner.....	\$2.654	\$2.499
Company miner laborer.....	2.374	2.129
Inside laborer.....	2.101	2.064
Outside laborer.....	1.745	1.812
First-class carpenters.....	2.575	2.562
First-class blacksmiths.....	2.653	2.636
Ashmen.....	1.760	1.638
Slaters, men.....	1.289	1.287
Bratticemen.....	2.332	2.448

TABLE X. AVERAGE RATES IN LARGER COLLIERIES OF DISTRICTS 1 AND 9

	1912 (After April)	1918 (After Nov.)	In- crease in Dol- lars	In- crease in Per Cent
Company miner.....	\$2.654	\$4.73	2.08	80.1
Company miner, lab- or.....	2.374	4.38	2.01	84.5
Inside laborer.....	2.101	4.236	2.13	101.6
Outside laborer.....	1.745	3.567	1.82	104.4
First-class carpenter.....	2.575	4.633	2.06	79.9
Carpenter—helper.....	1.891	3.727	1.83	97.1
First-class blacksmith.....	2.653	4.732	2.08	78.3
Blacksmith—helper.....	1.811	3.688	1.87	103.6
Ashmen.....	1.760	3.611	1.85	105.2
First-class slate pick- ers.....	1.289	2.713	1.52	110.5
Bratticemen.....	2.332	4.401	2.07	88.7
Trackmen (inside).....	2.661	4.737	2.07	78.0
Trackmen—helpers.....	2.115	4.167	2.05	96.7

The operators frequently claim that the rate for common labor outside the mines is the "yard-stick" by which all other rates have been measured and

TABLE VII. DAY RATES FOR PRINCIPAL OCCUPATIONS IN THE LARGER COLLIERIES OF DISTRICT 1 IN EFFECT IN NOVEMBER, 1918

	Com- pany Miner	Com- pany Miner's Laborers	Labor- ers Inside	Labor- ers Out- side	First- Class Car- penters	Ash Men
Old Forge Colliery—Penn. Coal Co.....	\$4.40	.....	\$4.09	\$3.84	\$4.855	\$3.635
National Colliery—D. L. & W.....	.....	.....	4.40	3.61	4.53	3.61
Van Storch Colliery.....	4.47	.....	4.11	3.61	4.685	3.61
Boston Colliery—D. & H. Coal Co.....	4.47	\$4.11	4.11	3.61	.....	3.61
So. Wilkes-Barre Colliery—L. & W. B.....	4.80	4.34	.....	3.67	4.62	3.67
Pine Brook Colliery—Scranton Coal Co.....	5.48	4.85	.....	3.49	4.64	3.61
Westmoreland Colliery—L. V. Coal Co.....	4.74	4.47	4.47	3.35	4.48	3.47
No. 5 Colliery—Susquehanna Coal Co.....	4.78	4.12	.....	3.355	4.62	3.67
Averages.....	\$4.73	\$4.38	\$4.236	\$3.567	\$4.633	\$3.611

	First Class Slate Pickers	Brat- ticemen	First Class Black- smiths	Black- smiths Helpers	Car- penter Helpers	Track- men (Inside)	Track- men Help- ers
Old Forge Colliery—Penn. Coal Co.....	\$3.43	\$4.09	\$4.855	\$3.635	\$3.84	\$4.855	\$4.09
National Colliery—D. L. & W.....	2.42	4.77	4.685	3.61	3.79	4.775	4.40
Van Storch Colliery.....	2.45	4.11	4.685	3.78	3.78	4.685	4.11
Boston Colliery—D. & H. Coal Co.....	4.47	4.47	4.685	3.61	.....	4.73	4.11
So. Wilkes-Barre Colliery—L. & W. B.....	2.45	4.49	4.67	3.67	3.67	4.80	4.34
Pine Brook Colliery—Scranton C. C.....	2.45	4.39	4.69	3.93	3.79	4.78	4.02
Westmoreland Colliery—L. V. Coal Co.....	2.44	.....	4.79	3.67	3.62	4.51	4.10
No. 5 Colliery—Susquehanna Coal Co.....	3.355	4.49	4.80	3.60	3.60	4.78	4.17
Averages.....	\$2.713	\$4.401	\$4.732	\$3.688	\$3.727	\$4.737	\$4.167

TABLE VIII. DAILY WAGE FOR INSIDE AND OUTSIDE DAY LABOR FOR DISTRICT 7

	Daily 1913	Wage 1920	Increase in Dollars	Relative 1913	Wage 1920	Increase in Per Cent
Inside:						
Day wage miners.....	\$2.54	\$4.60	2.06	100.0	181.1	81.1
Day wage laborers.....	2.20	4.25	2.05	100.0	193.2	93.2
Skilled labor.....	2.45	4.50	2.05	100.0	183.7	83.7
Semi-skilled labor.....	2.30	4.35	2.05	100.0	189.1	89.1
Outside:						
Common labor.....	1.54	3.31	1.77	100.0	214.9	114.9
Semi-skilled.....	1.54	4.25	2.71	100.0	275.9	175.9
Skilled.....	2.20	4.25	2.05	100.0	193.2	93.2

fixed. This, of course, is by no means the case, any more than the rate of building laborers determines the rate paid to brick masons and carpenters. There is no objection, however, to this method of determination provided the rate for common labor is set with due regard to the necessary standard of living, and that the differentials to be paid for added experience and skill are sufficiently high.

The present rate for common labor is on the average about 41 to 44c. per hour for an eight-hour day. This rate was set by the adjustment made in November, 1918, and, of course, is far too low under present conditions of prices. The minimum wage rate established by the National War Labor Board in June, 1918, was for localities similar to Pennsylvania either 42 or 42.5c. per hour, assuming an average ten-hour day.

MINIMUM TO BE \$5.61 PER DAY

The ruling in the street railway cases, for instance, was that "The intent of the award is to give every adult male employee affected engaged in an occupation essential to the operation of the company and whose rate is not specifically fixed by the award a daily wage of at least \$4.25 for ten hours' work." With an increased cost of living of about 32 per cent since June, 1918, this daily wage should be increased as of today to \$5.61.

This minimum rate fixed by the War Labor Board was not intended to give common labor an unusual rate but was granted in accordance with the ruling of the board that, "The period of the war is not a normal period of industrial expansion from which the employer should expect unusual profits or the employees abnormal wages; that it is an interregnum in which industry is pursued only for common cause and common ends."

The most recent investigation into the earnings of anthracite mine workers was made in January, 1919, by the U. S. Bureau of Labor Statistics. A half-month payroll period ended Jan. 31, 1919, was selected. In its report the bureau says "The ideal method of arranging the field work of a survey of this kind would be to have all the schedules cover the same payroll period. It was possible to carry this out in the anthracite field.

"All schedules in that branch of the industry are for the payroll period ended Jan. 31, 1919." . . . "In January mines were still running full time, though with diminished intensity. Thus all the mines included in the anthracite field were running full time on the date of the survey." . . . "No mines working less than full time were included in the survey" [in the anthracite field].

The half-month period of the survey included fourteen working days. Therefore in order to compute the average earnings of the year all that is necessary is to divide the total average earnings of the half-month period by fourteen in order to obtain the average

TABLE XI. AVERAGE FULL-TIME AND ACTUAL YEARLY EARNINGS BASED ON ONE-HALF MONTH PERIOD IN JANUARY, 1919

Occupation	Number of Employees	Full-time Daily Earnings A	Estimated Full-time Yearly Earnings 252 Days B	Actual Daily Earnings C	Estimated Actual Yearly Earnings D
Inside:					
Blacksmiths.....	30	\$4.733	\$1,193	\$5.254	\$1,324
Bratticemen.....	116	4.488	1,131	4.486	1,130
Cagers.....	234	4.160	1,048	4.699	1,184
Car runners.....	342	4.061	1,023	3.973	1,001
Company miners.....	656	4.651	1,172	3.914	987
Company miners, laborers.....	632	4.208	1,060	3.876	977
Consideration miners.....	498	5.085	1,281	4.586	1,156
Contract miners.....	4,887	6.735	1,697	5.683	1,432
Contract miners, laborers.....	1,855	5.112	1,288	3.571	900
Door tenders (boys).....	247	2.509	632	2.404	606
Drivers.....	479	3.990	1,006	3.761	948
Engineers.....	121	4.518	1,138	5.024	1,266
Laborers.....	1,200	4.200	1,058	3.939	993
Machinists.....	67	4.985	1,256	4.592	1,157
Masons.....	41	4.614	1,162	4.611	1,162
Motormen.....	247	4.462	1,124	5.199	1,310
Motor brakemen.....	190	4.014	1,012	4.274	1,077
Pumpmen.....	104	5.221	1,315	5.030	1,267
Timbermen.....	170	5.562	1,402	4.250	1,071
Trackmen.....	163	4.564	1,150	4.674	1,177
Total inside occupations.....	12,279	\$5.407	\$1,363	\$4.655	\$1,173
Outside:					
Ashmen.....	72	\$3.886	\$979	\$4.059	\$1,023
Blacksmiths.....	60	4.573	1,152	5.140	1,295
Cagers.....	119	3.701	932	4.332	1,092
Carpenters.....	250	4.516	1,138	5.306	1,337
Car runners.....	83	3.629	915	3.552	895
Dumpers.....	88	3.591	905	3.559	897
Engineers.....	248	4.500	1,134	5.271	1,328
Firemen.....	314	4.570	1,151	4.616	1,163
Laborers.....	1,211	3.549	894	3.710	935
Loaders.....	199	3.581	902	3.923	989
Machinists.....	112	4.132	1,041	5.200	1,310
Oilers.....	77	3.470	874	4.041	1,018
Repairmen.....	113	3.879	977	4.279	1,079
Timber cutters.....	115	3.619	912	4.208	1,060
Trackmen.....	28	3.814	961	3.947	995
Outside—Breaker:					
Jig runners.....	81	3.281	827	3.837	966
Platemens.....	180	3.441	867	3.652	920
Slaters (boys).....	580	2.386	601	2.139	539
Total outside occupations.....	3,930	\$3.629	\$914	\$3.884	\$979
Grand total—Inside and outside occupations.....	16,209	\$4.976	\$1,254	\$4.467	\$1,126

daily wage, and then multiply the resulting figure by 252, which was the average number of days worked during the year 1919.

In table XI is shown for each of the occupations the full-time daily earnings (column A). This is the average wage that would be earned per day while the mine was open if the employee worked. Column C gives the average actual daily wage—that is, the average wage earned per week day.

It is found, as explained above, by dividing the total average earnings for the 14-day period by 14. Where the figures in column C are lower than column A it means that the workers in that occupation did not work the full time for every day. Where C is higher than A it means that overtime was worked.

Column B is the estimated full-time earnings for the year 1919. It is found by multiplying the full-time daily earnings by 252, which was the estimated average number of days worked in the year.

Column D is the estimated actual yearly earnings for the year 1919. It is found by multiplying the actual daily earnings by 252.

While it is probable that 252 working days a year is rather more than can reasonably be expected for an average of the future, it is a less number than was worked during 1918 and 1917. This matter is fully discussed in the exhibit on the irregularities of employment.

Table XI shows the average yearly earnings for anthracite mine workers to be as in Table XII.

Note that the average actual earnings for outside occupations are larger than the full-time earnings. This is because of the large amount of overtime put in by the outside men. The chief difference between full time and actual earnings comes in the case of contract miners and their laborers, that

TABLE XII. AVERAGE YEARLY EARNINGS ANTHRACITE MINE WORK

	1919 Full-Time Earnings 252 Days	1919 Actual Earnings 252 Days
Inside occupations.....	\$1,363	\$1,173
Outside occupations.....	914	979
All occupations.....	1,254	1,126

is to say these two occupations apparently worked a smaller proportion of the full time than any other occupations.

These figures are really meaningless, however, as these two occupations depend not on hours but on tonnage. If the contract miners had worked the full time, the number of days worked by the mines would have been cut down, and the outside occupations would also have been forced to put in more overtime during the days worked than was actually the case.

While I have included earnings for overtime in the above table, I have done so simply because I had no data where-by I could segregate these earnings

and show what the daily and yearly earnings would be without overtime.

It seems but fair and in accordance with the best thought of economists

The distribution of the weekly earnings is shown by Table XV. This table shows the number of employees receiving weekly wages below \$10, and in

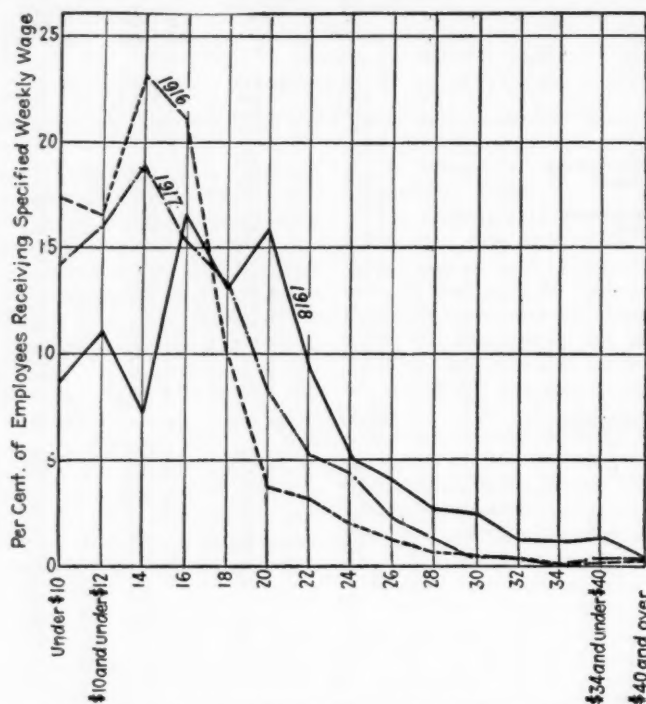


FIG. 2. PERCENTAGE OF ANTHRACITE EMPLOYEES RECEIVING ANY SPECIFIED WEEKLY WAGE

and with recent decisions of arbitration boards and commissions to base wage rates upon possible earnings during a reasonable number of hours per day and a reasonable number of days per year. "The amount of money to be earned by anticipated overtime should not be included in the amount to be established as a fair return to the worker."

AVERAGE WEEKLY EARNINGS

The Pennsylvania Workmen's Compensation Commission in a report compiled jointly by the Insurance Department of Pennsylvania and the statistical department of the Pennsylvania Compensation Rating and Inspection Bureau give the average weekly earnings of all employees in the anthracite industry as in Table XIII.

TABLE XIII. AVERAGE WEEKLY EARNINGS

Year	Average Weekly Earnings
1916	\$13.98
1917	15.02
1918	17.69

These earnings, however, are full-time earnings, assuming the mines to be open. They are computed by taking the six months' actual earnings and dividing by the days worked during the period. On this basis, taking the days worked from the reports of the U. S. Geological Survey, the actual average yearly earnings would be as in Table XIV.

TABLE XIV. AVERAGE YEARLY EARNINGS

Year	Average Yearly Earnings
1916	\$590
1917	713
1918	863

groups of \$2 increments, for 1916, 1917 and 1918. Fig 2 shows the same figures graphically.

The Pennsylvania Department of Internal Affairs reported average yearly earnings for anthracite workers for the years from 1903 to 1912, inclusive. Table XVI shows these earnings. The figures, however, are not as reliable as the figures computed from the survey of the U. S. Bureau of Labor Statistics nor are they as reliable as the figures reported by the Workmen's Compensation Commission.

TABLE XV. ANTHRACITE EARNINGS REPORTED BY PENNSYLVANIA WORKMEN'S COMPENSATION COMMISSION

Employees Receiving	1916		1917		1918	
	Number	Per Cent	Number	Per Cent	Number	Per Cent
Under \$10	289	17.2	279	14.3	133	8.5
\$10 and under \$12	277	16.5	311	15.9	172	11.1
\$12 and under \$14	387	23.1	372	19.1	111	7.1
\$14 and under \$16	348	20.8	297	15.2	260	16.7
\$16 and under \$18	172	10.3	263	13.5	203	13.1
\$18 and under \$20	63	3.8	144	7.4	246	15.8
\$20 and under \$22	53	3.2	102	5.2	144	9.3
\$22 and under \$24	33	2.0	84	4.3	79	5.1
\$24 and under \$26	21	1.2	44	2.3	64	4.1
\$26 and under \$28	11	0.7	25	1.3	41	2.6
\$28 and under \$30	9	0.5	7	0.3	38	2.4
\$30 and under \$32	5	0.3	9	0.4	19	1.2
\$32 and under \$34	0	0.0	3	0.1	18	1.2
\$34 and under \$40	4	0.2	9	0.5	21	1.3
\$40 and over	4	0.2	4	0.2	6	0.4
Totals	1,696	100.0	1,953	100.0	1,555	100.0

TABLE XVI. AVERAGE YEARLY EARNINGS PENNSYLVANIA ANTHRACITE MINES

	1912	1911	1910	1909	1908	1907	1906	1905	1904	1903	1902
Miners	729	744	711	651	673	717	641	690	685	701	496
Miners' laborers	496	510	468	441	387	489	421	458	462	447	...
Other inside men	541	558	526	489	505	574	463	530	781	461	363
Boys, inside	286	272	182	220	229	267	241	242	241	...	...
Outside workmen	527	535	541	482	500	558	494	543	542	480	306
Breaker employees	358	374	329	323	329	422	351	287	277	284	...
Boys, outside	242	232	209	192	206	278	...	...	...	...	...
Average	560	573	544	498	496	574	494	521	574	491	...

Local Demands Electric Lights Instead of Flame Safeties

Phalen local, at Glace Bay, N. S., is demanding that oil safety lamps be replaced by electric lamps. The coal company wants the miners to contribute \$7.89 toward their cost and also to supply caps and belts, but the men refuse to pay any part of the cost, and are steadfastly determined not to use the old oil safety lamps.

Broad-Top Field Goes on Strike To Keep Its Differential

During the war the Broad-Top field secured a differential of 10c. a ton over the rest of the operations in the central Pennsylvania, or No. 2, district. This differential the Broad-Top mine workers believe is part of the scale ordered by the Bituminous Coal Commission and a provision not to be denied now that the increase in wage has been granted. The International officials have the same opinion and on July 11 on call of International President Lewis 3,000 mine workers went on strike.

Alex Howat, District President, May Be Denied Voting Rights

Alex Howat, of Pittsburg, Kan., Socialist leader of the Kansas mine workers, who was born in Scotland, will be denied a vote unless he can produce proof that he or his father have taken out second naturalization papers. If he has no papers it will be hard for him to get them from Judge Andrew J. Curran, who recently sent him to jail for his contempt of the Kansas Industrial Court in the coal strike case. Andrew Howat, the brother of Alex, has not been allowed to register because he could not prove his citizenship individually or through his father's naturalization. Alex Howat is almost certainly similarly embarrassed.

Yearly Earnings in Anthracite Mines Much Lower than in Bituminous Says Statistician Jett Lauck*

**Bituminous Mine Workers Formerly Got Lower Pay than Anthracite Men
—Day Rates of Hard-Coal Daymen Should Be Raised 40 to 50 Per Cent
—Anthracite Miner Should Get 27 Per Cent to 65 Per Cent Advance**

The present yearly earnings in the anthracite mines are considerably lower than those in the bituminous mines of Pennsylvania, although in former years there was little difference between the two industries. This is shown in Table I.

TABLE I. COMPARISON OF YEARLY EARNINGS OF ALL EMPLOYEES IN THE ANTHRACITE AND BITUMINOUS MINES OF PENNSYLVANIA

	Average Earnings Anthracite Employees	Average Earnings Bituminous Employees
1903.....	\$491	\$541
1904.....	574	452
1905.....	521	503
1906.....	494	545
1907.....	574	604
1908.....	496	458
1909.....	498	524
1910.....	544	574
1911.....	573	584
1912.....	560	663
1913.....	No data	No data
1914.....		
1915.....		
1916.....	590	689
1917.....	713	877
1918.....	863	1,216
1919.....	1,126	1,337

The sources from which Table I is compiled are as follows: The figures for the years 1903 to 1912, inclusive, are taken from the reports of the Pennsylvania State Department of Internal Affairs, and are computed by the statistical bureau of that department by dividing the total yearly payroll by the average number of total employees.

The basic figures upon which this Statistical Bureau made its report were furnished by the operators of the coal mines, and it is to be presumed, therefore, that the figures are accurate. Of course, the resulting earnings in Table I cannot be compared from year to year—that is, the year 1903 cannot be compared with the year 1916, nor the year 1916 with the year 1919, because, as shown below, the source is different and the method of computing the figures is different.

COMPARABLE FIGURES

But each year presents comparable figures as between the anthracite and the Pennsylvania bituminous fields, because in each year the figures for the two fields are derived from the same source and the same method of computation is used. It is doubtless true, moreover, that the figures from the Department of Internal Affairs reflect accurately the relative conditions as to earnings between the two fields, though the absolute earnings cannot be so confidently relied upon.

*Employees' Exhibit No. 4 before the U. S. Anthracite Coal Commission, entitled "Comparison of Earnings and Wage Rates in the Anthracite and Bituminous Mines of Pennsylvania," presented by Jett Lauck.

The figures for 1916 to 1918, inclusive, are derived from a report of the Pennsylvania State Workmen's Compensation Commission, compiled jointly by the Insurance Department of Pennsylvania and the statistical department of the Pennsylvania Compensation Rating and Inspection Bureau. These figures are published as average full-time weekly earnings, from which the yearly earnings are derived by first finding the daily earnings and then multiplying by the number of days worked in the respective fields in Pennsylvania as reported by the U. S. Geological Survey.

Here again the same method of computation is followed for both anthracite and bituminous earnings, so a comparison between the two fields for any one year presents the relative difference during that year.

THIS FROM LABOR BUREAU

The figures for 1919 are based upon a survey made by the U. S. Bureau of Labor Statistics. The survey of the anthracite mines was made at a time when all the mines covered by the survey were working full time, and the yearly earnings given in Table I are the average daily earnings found by the survey multiplied by the average number of days worked (252) in the anthracite field during 1919. These figures include a large amount of overtime earnings that should preferably be omitted. The survey of the bituminous mines was made at a time when the mines were operating from one-half to full time, the actual proportion of full time that the mines were in operation being 73.3 per cent. The figures in Table I are twenty-four times the weighted average of the actual earnings for Pennsylvania found for a half month payroll period by the survey, and correspond to an average of 246 days worked during the year.

TABLE II. DAYS WORKED FIRST 10 MONTHS OF 1919

Pittsburgh thick vein district.....	217
Pittsburgh thin vein district.....	197

During the year 1919 there was a strike in the bituminous field of Pennsylvania that disorganized the industry for about two months. In making the comparison of yearly earnings between anthracite and bituminous workers it is thought preferable to eliminate this strike from the computations. Before the President's Bituminous Coal Commission the soft coal operators pro-

duced figures of days worked in the Pittsburgh thick-vein district and the Pittsburgh thin-vein district for the first ten months of 1919 as given in Table II.

At this rate, the days worked during a year of twelve months would be for 1919 from 261 to 236, the simple average of which is 248, or substantially the same as the 246 figure in which our computation results.

COKE WORKERS INCLUDED

The bituminous earnings in Table I include also in the years 1904 to 1912, inclusive, a small number of coke workers, an occupation that has no parallel in the anthracite industry. The effect of this inclusion is minute, however, as the coke workers form less than 7 per cent of the total number of bituminous workers, and, as their average wage is not far from the average wage of all the employees, the maximum variation being from 7.16 per cent higher to 7.99 per cent lower than the average wage. The effect of the inclusion of the coke workers is, therefore, less than one-half of 1 per cent.

Attention is called to the fact that the anthracite average earnings include those of boys to a greater extent than do the bituminous earnings. This fact makes Table I a conservative one, because the fact that is brought out below is that in the early years the anthracite earnings were on an average about the same as the bituminous earnings, whereas in the recent years the bituminous earnings have become considerably greater than the anthracite earnings.

BOYS BEING DROPPED

The number of boys employed during the early years was much greater than now, and their age (and proportionate earnings) was formerly lower than it now is. Thus if the boys had been omitted from Table I the change that has taken place in the relation between anthracite and bituminous earnings would be shown to be greater than Table I exhibits. In support of this statement Table III gives the percentage of boys employed in the year 1902 (in the collieries of the Lehigh Coal & Navigation Co., according to the report of the Anthracite Strike Commission) and for the year 1919 (from the report of the Bureau of Labor Statistics of its survey in January, 1919):

TABLE III. NUMBER OF BOYS AND PERCENTAGE OF BOYS TO ALL EMPLOYEES IN LEHIGH COAL & NAVIGATION CO.

	Number of Boys		Per Cent of Total Employees	
	1902	1919	1902	1919
Inside mines.....	114	247	2.227	1.524
Outside mines.....	761	580	14.864	3.578
Totals.....	875	827	17.091	5.102

Thus during the years when the number of boys was relatively high the earnings of the two fields were about

the same, while for the years when the number of boys was low the anthracite earnings (which include the earnings of these boys) was lower than the bituminous earnings, so if the boys were

to 20 per cent for the daymen). In order, then, to bring the existing anthracite rates up to the level of the bituminous rates as thus increased, it would be necessary to increase the present

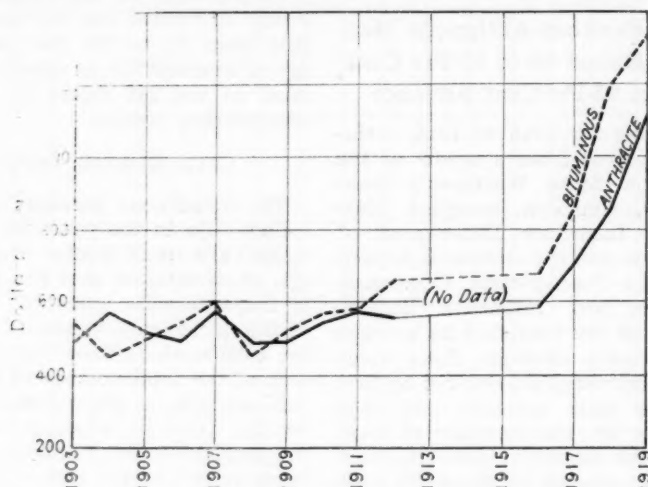


FIG. 1. COMPARISON OF YEARLY EARNINGS IN ANTHRACITE AND BITUMINOUS MINES OF PENNSYLVANIA

Jett Lauck would urge on the Anthracite Coal Commission that, whereas in earlier years the anthracite wage earner made more than the bituminous, he is now no longer so privileged but looks on his bituminous fellow worker as better paid than himself.

omitted from the total average the relative change that has taken place would be, as stated above, greater than is shown in the table.

The figures in Table I are shown graphically in Fig. 1.

It is evident that from 1903 to 1911 the earnings in the anthracite mines were approximately the same as they were in the bituminous mines of Pennsylvania. Sometimes one is higher, and sometimes the other. In recent years, however, the bituminous earnings have been considerably higher than in the anthracite mines, the average exceeding the anthracite average by the following yearly amounts:

TABLE IV. AMOUNTS AND PERCENTAGES BY WHICH YEARLY AVERAGE EARNINGS IN THE BITUMINOUS MINES OF PENNSYLVANIA EXCEED THE YEARLY AVERAGE EARNINGS IN THE ANTHRACITE MINES

	Amounts	Percentage
1916.....	\$ 99	16.8
1917.....	164	23.0
1918.....	353	40.9
1919.....	211	18.7

Thus in order to raise the earnings of the anthracite workers to the same level as that of the bituminous workers, on the basis of the number of days worked in the respective fields during 1919, it would be necessary to increase the basic rates in the anthracite mines of 18.7 per cent.

FIFTY PER CENT TO EVEN UP

The recent increase awarded to the bituminous mine workers by the President's Bituminous Coal Commission was stated by that commission to be an average of about 27 per cent (the award amounted to between 27 per cent and 34 per cent for the miners and

anthracite rates by 18.7 per cent, and then by 27 per cent on top of that, or a total increase of 50.74 per cent.

Subdividing the mine workers into groups of occupations, the average yearly earnings for each group from 1903 to 1912 is shown by the Tables V and VI.

The figures in Tables V and VI are from the reports of the Pennsylvania State Department of Internal Affairs. It should be noted that the earnings of the anthracite miners exceeded each year the earnings of the bituminous miners, both those that worked with the pick and those who operated a machine, the percentage difference being as shown in Table VII.

If the work done by the anthracite contract miner and the bituminous pick miner is at all comparable, it seems as though the anthracite miner necessarily requires more experience and skill. Nevertheless the anthracite miner has lost the differential in earn-

TABLE VII. PERCENTAGE BY WHICH YEARLY EARNINGS OF ANTHRACITE MINER FORMERLY EXCEEDED YEARLY EARNINGS OF BITUMINOUS PICK MINER

1903.....	30.3	1908.....	50.5
1904.....	54.6	1909.....	24.2
1905.....	40.5	1910.....	20.9
1906.....	23.5	1911.....	29.8
1907.....	19.1	1912.....	10.0
Simple average.....		30.3	

ings that he formerly possessed, as is shown by a study made by the U. S. Bureau of Labor Statistics in June, July and August of 1918.

MINERS GET \$6.26 PER START

At that time it was found that the average earnings per day that the mine is open (per "start") of the anthracite contract miner was \$5.62. The correctness of this figure was checked by inquiries made of the principal anthracite companies of Pennsylvania, asking for a statement of the number of contract miners employed in all the collieries of each company and the average net earnings per "start"—that is, earnings after deductions for mine supplies and blacksmithing. Returns were received from sixty-nine companies, representing 33,395 contract miners. The average earnings for all of these sixty-nine companies was \$5.59, against \$5.62, as shown by the data collected by the bureau's agents.

In November, 1918, an increase was granted in the contract rates of the anthracite mines amounting to 12 per cent, and this 12 per cent raised the average earnings of \$5.59 to \$6.26.

The study of the bureau was extended also to the bituminous field of Pennsylvania, and it was found that the average earnings of the bituminous pick miner was \$6.22, or substantially the same as the earnings of the anthracite contract miner after the increase of November, 1918, so the anthracite contract miner, instead of receiving greater earnings than the bituminous miner, as he did through all the years from 1903 to 1912, was in 1919 on substantially the same basis per day, while, owing to the award of the Pres-

TABLE V. AVERAGE YEARLY EARNINGS IN PENNSYLVANIA ANTHRACITE MINES

	1912	1911	1910	1909	1908	1907	1906	1905	1904	1903	1902
Miners.....	\$729	\$744	\$711	\$651	\$673	\$717	\$641	\$690	\$685	\$701	\$496
Miners' laborers.....	496	510	468	441	387	489	421	458	462	447	.....
Other inside men.....	541	558	526	489	505	574	463	530	781	461	363
Boys—inside.....	286	272	182	220	229	267	241	242	241	.....	.....
Outside workmen.....	527	535	541	482	500	558	494	543	542	480	306
Breaker employees.....	358	374	329	323	329	422	.....	.....	.....	.....	.....
Boys—outside.....	242	232	209	192	206	278	351	287	277	284	.....
Averages.....	\$560	\$573	\$544	\$498	\$496	\$574	\$494	\$521	\$574	\$491	.....

TABLE VI. AVERAGE YEARLY EARNINGS IN PENNSYLVANIA BITUMINOUS MINES

	1912	1911	1910	1909	1908	1907	1906	1905	1904	1903	1902
Miners—pick.....	\$674	\$573	\$588	\$524	\$447	\$602	\$519	\$491	\$443	\$538	\$504
Miners—machine.....	654	554	537	507	447	540	496	495	.....	.....	.....
Other inside men (over 16).....	709	659	641	564	592	721	666	525	488	474	547
Other inside boys (under 16).....	421	293	254	251	275	256	223	221	173	223	.....
Outside men (over 16).....	631	615	518	529	539	650	624	525	488	530	454
Outside boys (under 16).....	314	259	277	216	169	425	212	222	176	240	.....
Coke workers.....	610	553	538	501	424	586	570	539	445	.....	.....
Averages.....	\$663	\$584	\$574	\$524	\$458	\$604	\$545	\$503	\$452	\$541	.....

ident's Coal Commission, he is now considerably behind the bituminous miner.

The study of the bureau in 1918 showed the amounts given in Table VIII were those by which the daymen in the bituminous mines exceeded the daymen in the anthracite mines. In considering Table VIII it should be noted that in the anthracite region there is a larger proportion of unskilled outside workers than in the bituminous industry, and that it is these men who are the most behind the bituminous scale, though formerly their yearly earnings were about on an equality.

NOT PROPERLY WEIGHTED

Table VIII of the Bureau of Labor Statistics is not a weighted average but it is a mean between the high and the low rates. The correctness of the bureau's figures, however, is evidenced by the estimate it made of the 1918 earnings of the contract miner, which later investigation checked, as stated above, within 3c. per day.

The above differences between the daily earnings in the two industries fully explain the difference of 40.9 per cent that was shown above to exist in 1918 by the figures of the State Workmen's Compensation Commission. In this connection it is well to remember that the daymen in the anthracite and in the bituminous industries are fairly comparable in their work, though, of course, little comparison can be made between the occupations of the miners of the two fields.

Thus there is every reason why the anthracite daymen should expect to receive as high a wage as the daymen in the bituminous field, and at the

TABLE IX. DAYS WORKED IN ANTHRACITE AND BITUMINOUS FIELDS

	Pennsylvania Anthracite	Pennsylvania Bituminous	Per Cent by Which Anthracite Days Worked is Lower than Bituminous
1890.....	200	232	...
1891.....	203	223	...
1892.....	198	223	...
Average for period..	200.3	226.0	13
1893.....	197	190	...
1794.....	190	165	...
1995.....	196	206	...
1896.....	174	206	...
1897.....	150	205	...
Average for period..	181.4	194.2	7
1898.....	152	229	...
1899.....	173	245	...
1900.....	166	242	...
1901.....	196	230	...
1902.....	116	248	...
Average for period..	160.6	238.8	49
1903.....	206	235	...
1904.....	200	196	...
1905.....	215	231	...
1906.....	195	231	...
1907.....	220	255	...
Average for period..	207.2	229.6	11
1908.....	200	201	...
1910.....	229	238	...
1911.....	246	233	...
1912.....	231	252	...
1913.....	257	267	...
Average for period..	232.6	238.2	3
1914.....	245	214	...
1915.....	230	226	...
1916.....	253	259	...
1917.....	285	261	...
1918.....	293	269	...
Average for period..	261.2	245.8	...
1919 Estimated.....	252	...	...

TABLE VIII. COMPARISON OF DAILY EARNINGS IN 1918 OF ANTHRACITE AND BITUMINOUS MINE WORKERS

	Anthracite Average	Bituminous Average	Average Exceeds Anthracite Amount	Bituminous Exceeds Anthracite Percentage
Outside:				
Blacksmiths.....	\$3.44	\$4.96	\$1.52	44
Carpenters.....	3.39	4.89	1.50	44
Hoisting engineers.....	3.55	4.80	1.25	35
Stationary engineers.....	3.03	4.93	1.90	63
Power engineers.....	3.53	4.93	1.40	40
Locomotive engineers.....	3.25	4.90	1.65	51
Firemen.....	3.12	4.60	1.48	48
Footmen and headmen.....	2.77	5.00	2.23	81
Jig runners.....	2.52	4.67	2.15	85
Laborers.....	2.78	4.24	1.46	53
Machine repairmen.....	3.43	4.67	1.24	36
Slaters (boys).....	1.89	2.65	.76	40
Stablemen.....	3.02	4.10	1.08	36
Teamsters.....	2.82	3.86	1.04	37
Trackmen.....	2.95	4.89	1.94	65
Drivers.....	2.47	5.00	2.53	102
Inside:				
Blacksmiths.....	3.66	4.96	1.30	35
Bratticemen and carpenters.....	3.46	5.00	1.54	45
Door boys.....	1.95	2.68	.73	37
Drivers.....	2.87	5.00	2.13	74
Engineers, locomotive.....	3.46	5.10	1.64	47
Slope engineers.....	3.26	5.10	1.84	56
Footmen and headmen.....	3.05	5.00	1.95	64
Laborers.....	3.22	4.77	1.55	48
Machine repairmen.....	3.48	4.67	1.19	34
Company miners.....	3.71	5.00	1.29	35
Pipemen.....	3.38	4.92	1.54	46
Pumpmen.....	3.45	5.51	2.06	60
Car runner.....	3.11	4.77	1.66	53
Stablemen.....	3.41	4.10	.69	21
Ti ubermen.....	3.60	5.00	1.40	39
Track layers.....	3.55	5.00	1.45	41

same time it is entirely reasonable for the anthracite contract miner to feel that he is entitled to receive as much higher earnings than the bituminous pick miner as he was accustomed to get during the pre-war years from 1903 to 1912.

The wage adjustment that was made in November, 1918, added about a dollar a day to the earnings of the anthracite daymen. This reduces, as of the year 1919, the amounts by which the bituminous earnings exceed the anthracite earnings by an equal amount. This cuts down the per cent excess of the bituminous men and accounts for the reduction, found above, in the excess that bituminous yearly earnings exceeded anthracite yearly earnings (this reduction was from 40.9 per cent in 1918 to 18.7 per cent in 1919).

Before the start of the war in 1914 the average days worked in the Pennsylvania bituminous mines exceeded the days worked in the anthracite

mines. This is shown in Table IX, and graphically in the Fig. 2. The figures are taken from reports of the U. S. Geological Survey.

It is probable that with the coming of normal conditions the pre-war comparison between the two fields will once more be restored, though it is not to be expected that the difference will be as great as existed prior to 1903 (that is, prior to the introduction of the summer discount in the anthracite market). If this is the case, then, the average number of days worked in the anthracite field may be expected to be lower than in the bituminous field by from 3 per cent to 11 per cent.

The day rates in the anthracite field, then, should be from 3 per cent to 11 per cent higher than in the bituminous field. Formerly they were higher, but now they are decidedly lower.

Table X gives the average daily wages in the two fields from 1903 to 1912, inclusive, as reported by the

TABLE X. AVERAGE DAILY WAGE OF PENNSYLVANIA ANTHRACITE MINERS

	1912	1911	1910	1909	1908	1907	1906	1905	1904	1903	1902
Miners.....	\$3.54	\$3.19	\$3.15	\$3.06	\$3.03	\$2.95	\$3.09	\$2.97	\$2.96	\$2.96	\$2.83
Miners' laborers.....	2.40	2.19	2.07	2.07	1.74	2.01	2.03	1.97	2.00	1.89	...
Other inside men.....	2.63	2.40	2.33	2.30	2.27	2.36	2.24	2.29	3.38	1.94	2.10
Boys—inside mine.....	1.39	1.17	.81	1.03	1.03	1.10	1.16	1.07	1.05	...	...
Outside workmen.....	2.56	2.30	2.40	2.26	2.25	2.30	2.38	2.34	2.34	2.03	1.73
Breaker employees.....	1.74	1.61	1.45	1.52	1.48	1.74	1.69	1.24	1.20	1.20	...
Boys—outside.....	1.17	1.00	.93	.90	.93	1.15	...	...	...	...	...
Averages.....	\$2.72	\$2.46	\$2.41	\$2.34	\$2.23	\$2.36	\$2.39	\$2.24	\$2.48	\$2.07	...

TABLE XI. AVERAGE DAILY WAGE OF PENNSYLVANIA BITUMINOUS MINERS

	1912	1911	1910	1909	1908	1907	1906	1905	1904	1903	1902
Miners—pick.....	\$2.52	\$2.31	\$2.26	\$2.01	\$1.90	\$2.24	\$2.53	\$2.18	2.17	2.29	2.16
Miners—machine.....	2.44	2.24	2.04	2.01	1.88	2.01	2.41	2.20	...	...	...
Other inside men (over 16).....	2.65	2.66	2.24	2.16	2.49	2.31	3.25	2.33	2.39	2.45	2.24
Other inside boys (under 16).....	1.57	1.18	.96	.96	1.15	.95	1.09	.93	.85	.95	...
Outside men (over 16).....	2.35	2.48	1.97	2.07	2.26	2.42	3.04	2.33	2.39	2.26	1.87
Outside boys (under 16).....	1.17	1.04	1.04	.83	.71	1.58	1.03	.98	.86	1.02	...
Coke workers.....	2.07	2.23	2.23	1.92	1.78	2.19	2.04	2.06	2.05	...	...
Averages.....	\$2.48	\$2.35	\$2.19	\$2.00	\$1.93	\$2.25	\$2.66	\$2.21	\$2.26	\$2.31	...

Pennsylvania State Department of Internal Affairs.

As seen in Tables X and XI, the daily wage of the anthracite miner was higher than that of the bituminous miner, while in the other occupations the anthracite wage is either higher or else fluctuates.

As contrasted with this, the average

As it is probable, judging the future by the past, that the average days worked in the anthracite field will be from 3 per cent to 11 per cent lower than the average number of days worked in the Pennsylvania bituminous field, the anthracite worker, on this basis alone, should receive a wage rate from 3 per cent to 11 per cent higher

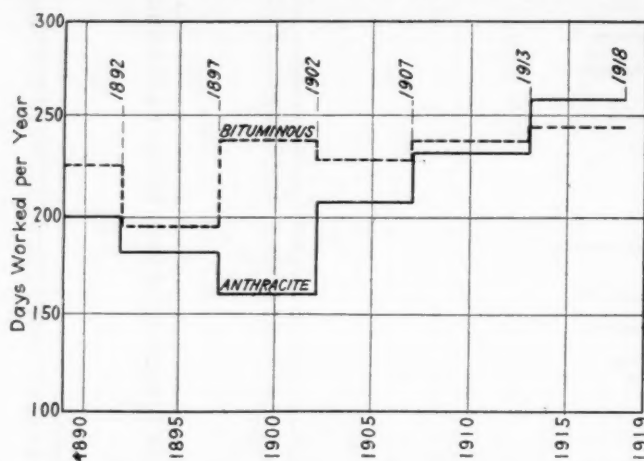


FIG. 2. SHOWING THE NUMBER OF DAYS WORKED BY FIVE-YEAR AVERAGES IN ANTHRACITE AND BITUMINOUS REGIONS

The period 1907-1913 covers six years, but one year, 1919, is omitted, as the data obtainable for that year are not accurate. Mr. Lauck would show by this chart that on the whole the Pennsylvania bituminous mines work more steadily than the anthracite mines and he declares that the showing in the last quinquennial period is abnormal and the result of the war.

hourly earnings, as found in 1919 by the survey of the U. S. Bureau of Labor Statistics are given in Table XII.

In every occupation given the bituminous hourly earnings are considerably higher than the anthracite. The basic day rates from the agreements of the two industries are as in Table XIV, while Table XV shows the rates in more detail.

TABLE XII. AVERAGE EARNINGS PER HOUR, ANTHRACITE FIELD

Occupation	
Inside:	
Blacksmiths.....	\$0.592
Brattice men.....	.561
Cagers.....	.517
Car runners.....	.507
Company miners.....	.581
Company miners' laborers.....	.526
Consideration miners.....	.636
Contract miners' laborers.....	.842
Door tenders (boys).....	.315
Drivers.....	.499
Engineers.....	.542
Laborers.....	.518
Machinists.....	.568
Masons.....	.577
Motormen.....	.558
Motor brakemen.....	.502
Pumpmen.....	.413
Timbermen.....	.695
Trackmen.....	.570
Total inside occupations.....	.673
Outside:	
Ashmen.....	.444
Blacksmiths.....	.572
Cagers.....	.458
Carpenters.....	.560
Car runners.....	.454
Dumpers.....	.449
Engineers.....	.532
Firemen.....	.503
Laborers.....	.434
Loaders.....	.448
Machinists.....	.517
Oilers.....	.434
Repairmen.....	.485
Timber cutters.....	.452
Trackmen.....	.477
Outside Breaker:	
Jig runners.....	.410
Platemen.....	.430
Slaters (boys).....	.298
Total outside occupations.....	.442
Grand total inside and outside occupations.....	.617

than the bituminous wage rate for the corresponding occupation in order that his yearly earnings may equal the yearly earnings in the bituminous field.

The occupations that are the more nearly comparable in the two fields are those of the daymen, especially outside the mines. In the years from 1903 to 1912 the yearly earnings of these men in the two fields were substantially the same, sometimes the one field being higher, sometimes the other. From 1916 on the yearly earnings of the daymen in the bituminous field increased faster than did those in the anthracite field.

In 1918 the bituminous rate was 40 per cent or more in excess of the anthracite rate. This difference in rates was somewhat balanced by the fact that in 1918 the anthracite men worked an abnormal number of days. The November, 1918, anthracite adjustment reduced the difference between the two fields to about 15 per cent or 20 per cent, but this difference has been recently increased by the bituminous award of 20 per cent to the daymen to a total difference between the two fields of about 40 to 50 per cent.

With the bituminous rates for daymen between 40 per cent and 50 per cent higher than anthracite day rates, and with the probability that the days worked per year will be slightly lower in the anthracite fields than in the Pennsylvania bituminous field, it is evident that the present anthracite day rates should be increased a substantial amount if the old equality between the two fields is to be restored and the anthracite daymen be allowed yearly earnings somewhat similar in amount to those of the bituminous daymen.

TABLE XIII. AVERAGE EARNINGS PER HOUR, PENNSYLVANIA BITUMINOUS

Drivers.....	\$0.634
Laborers, inside.....	.599
Laborers, outside.....	.516
Loaders.....	.835
Miners, hand.....	.902
Miners, machine.....	.913
Trackman.....	.628

TABLE XIV. BASIC DAY RATES IN THE TWO INDUSTRIES

Occupation	Anthracite	Bituminous (1919 Rates)
Inside:		
Semi-skilled.....	\$4.00 to \$4.50	\$4.75
Skilled.....	4.50	5.00
Company miners.....	4.75	....
Company miners' laborers.....	4.50	....
Outside:		
Common labor.....	3.31	4.10
Semi-skilled.....	4.25	4.75
Skilled.....	4.25	5.10

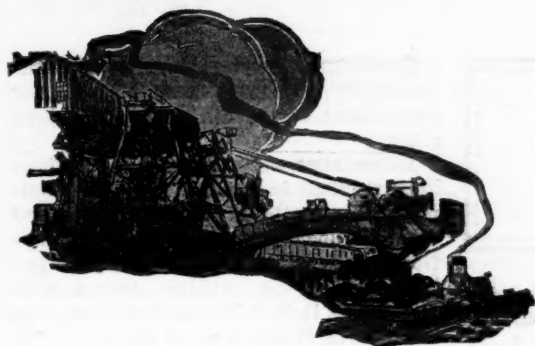
TABLE XV. RATES BY ANTHRACITE LABOR DISTRICTS

Occupation	Percentage
Districts 1 and 9:	
Company miner.....	4.73
Company miner-laborer.....	4.38
Inside laborer.....	4.236
Outside laborer.....	3.567
Carpenter, first class.....	4.633
Carpenter helper.....	3.727
Blacksmith, first class.....	4.732
Blacksmith, helper.....	3.688
Ashmen.....	3.611
Slate pickers, first class, men.....	2.713
Bratticemen.....	4.401
Trackmen, inside.....	4.737
Trackmen, helpers.....	4.167
District 7:	
Inside—	
Day wage miners.....	4.60
Day wage laborers.....	4.25
Skilled labor.....	4.50
Semi-skilled.....	4.35
Outside:	
Common labor.....	3.31
Semi-skilled.....	4.25
Skilled.....	4.25

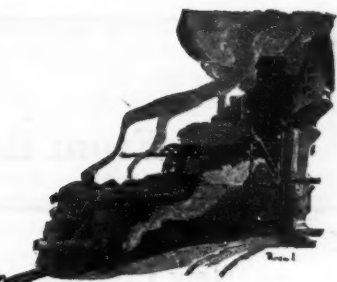
TABLE XVI. RATES IN BITUMINOUS DISTRICTS OF PENNSYLVANIA, 1919

Occupation	Percentage
Inside:	
Track layers.....	5.00
Track layer helpers.....	4.75
Trappers.....	2.65
Drivers.....	5.00
Timbermen.....	5.00
Pipemen.....	4.92
Wiremen.....	5.00
Motormen.....	5.10
Bottom cagers.....	5.00
Trip riders.....	5.00
Water and machine haulers.....	5.00
All other inside.....	4.75
Outside:	
Dumpers.....	4.42
Trimmers.....	4.36
Ram operators.....	4.60
Pushers.....	4.18
Car cleaners.....	4.10

The anthracite miner during the years 1903 to 1912 received yearly earnings considerably in excess of the yearly earnings of the bituminous miner, the average (unweighted) excess during the year in question being about 30 per cent. His daily earnings in 1918 amounted to about 12 per cent less than the daily earnings of the bituminous pick miner (which was, however, nearly balanced by the abnormal number of days during that year that the anthracite mines worked). The November, 1918, anthracite wage adjustment placed the daily earnings of the miners in the two fields about equal, but the bituminous award, which amounted to about 27 per cent to the Pennsylvania pick miner, has again placed the bituminous miner ahead.



Production and the Market



Weekly Review

Universal Agreement That Lack of Transportation Hampers Industrial Prosperity Centers Interest in Decision on Request for Revision of Order No. 7—N. Y. Central Confiscates Coal—Production Decreases.

EVENTS have crowded the forefront in the realm of coal the past week. The hearings at Washington before the Interstate Commerce Commission developed a singular unanimity of opinion that the coal situation is acute throughout the country and that lack of transportation is the one factor affecting the production of coal and the prosperity of many other industries. Interest now centers in the decision of the commission, which may take the form of a revision of Order No. 7, giving preference to coal in the use of open-top cars, or, as the coal industry and the public utilities have asked, the order will be extended beyond the original thirty days that expire July 21. The hearings were attended by coal men from all over the country, most of whom remained for the meetings of this week called by the National Coal Association to discuss ways and means of putting the coal industry at the service of the country in the present crisis.

Rumors are current that the President will re-establish the Fuel Administration by the authority that still remains under the Lever Act. Coal men are endeavoring to work out a plan that will give New

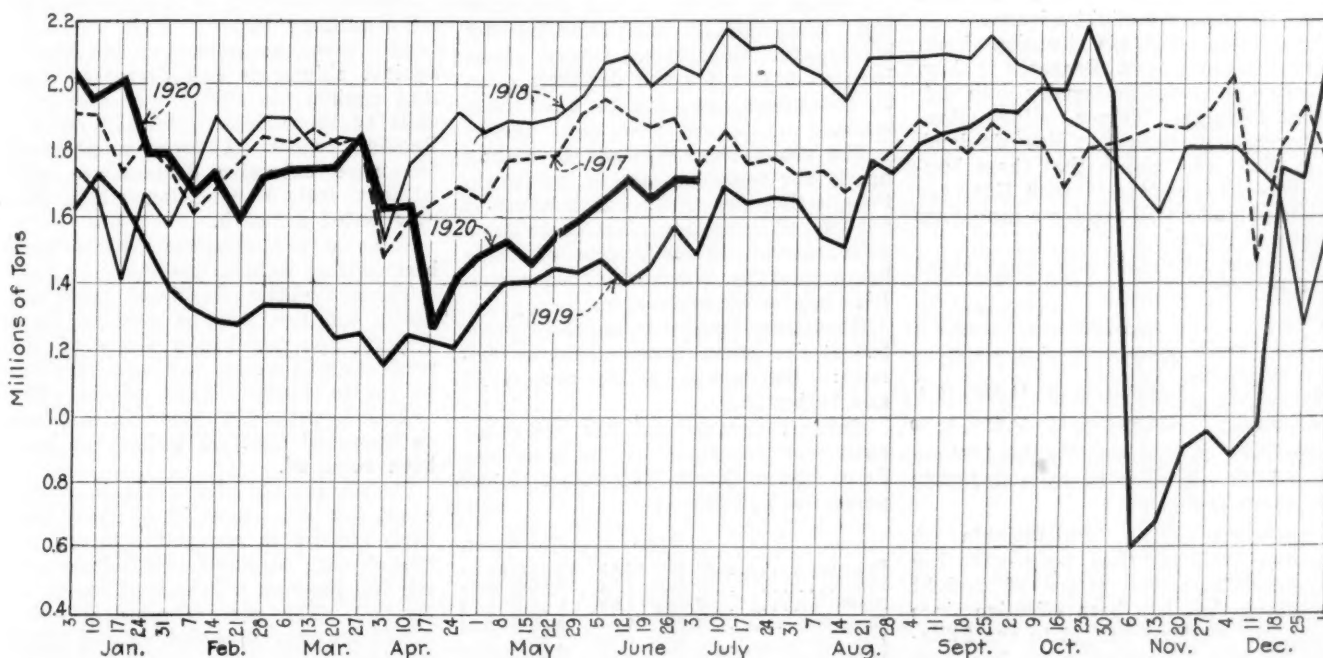
England and the Northwest the coal that they require and that will curb high prices without having the industry straddled with Government regulation again.

Production of bituminous coal dropped again in the week ending July 3 and of course was low the week of the holiday. So serious is the lack of output that the New York Central has been confiscating coal. When this road has to resort to such means to maintain fuel supply, conditions are indeed bad. The reports of the Geological Survey show that stocks are very low in some sections and that the movement of soft coal to the Lakes is not gaining. Production of both anthracite and beehive coke also decreased.

Lake Coal Dumped Season to July 10 (NET TONS)

	Cargo	Fuel	Total
1919.....	10,497,770	469,370	10,967,140
1920.....	4,660,895	372,482	5,033,377

Average Daily Production of Bituminous Coal*



*From weekly report of Geological Survey.

Reports From the Market Centers

New England

BOSTON

Spot Market Continues Active—Increase in Stocks Due to Reduced Consumption—Price Holds Firm or Higher—Slow Despatch at Hampton Roads—Anthracite Shipments Are Crippled by Trainmen's Strike.

Bituminous—There is no recession in prices. The spot market continues with the same buoyancy that was characteristic through June. Whether buyers have more or less coal on hand seems to make no difference; the demand is insistent and all offerings, almost regardless of price or grade, are readily absorbed. It is not at all surprising that prices keep on soaring.

It is understood, as the result of a careful survey, that the average amount on hand among the larger consumers is slightly over 30 days supply. It has been noted in several industrial centres here that stocks have somewhat increased during the past month, but much of this is due to reduced consumption. However, there is no let-up in the demand. Producers are still in a position to exact the limit on price.

During the current week, \$12 and upward has been paid for coal at first hands. These prices are f.o.b. mines in central Pennsylvania for July shipment. Conservative interests who, because of traffic embargoes find themselves with small tonnages of free coal to dispose of, have made sales either at contract prices or at only a slight advance.

The Hampton Roads situation shows no real improvement. Despatch is slow, although it varies materially with different shippers. We see no indication of increased movement to New England. It is likely this month that those buyers who have contracts with Hampton Roads shippers will receive a somewhat increased quota.

Prices at wholesale now range about as follows:

	Clearfields	Cambrias and Somersets
F.o.b. mines, net tons	\$10.75@12.25	\$10.75@12.25
F.o.b. Philadelphia, gross tons	14.00@15.65	14.00@15.6
F.o.b. New York, gross tons	14.35@16.00	14.35@16.00

On cars, Boston and Portland, there have been recent sales from \$17@22 per gross ton.

Anthracite—The Philadelphia & Reading Railway has been suffering severely from the strike of freight trainmen that has been effective since June 19. Coal movement to the Philadelphia and New York piers has been much crippled, and so light were the receipts of empties from connecting

lines that domestic sizes have been distributed largely to local points, this to prevent collieries from shutting down.

Only slow progress is being made at the Tidewater piers. It takes days instead of hours to load barges under these conditions. Until more trainmen get back to work, however, there is small chance of any real improvement.

Tidewater

NEW YORK

Rail and Towing Conditions Improve and Anthracite Situation Is Easier—Demand Is Strong—Bituminous Moves Slowly, but Prices Change Little If Any—Local Supply Is Short.

Anthracite—The situation is easier although production and shipments were curtailed the early part of the week because of the holiday and railroad conditions. More coal has come into the city, due, in part, to the resumption of the regular towing service from Perth Amboy and a betterment in towing from some of the other ports.

Conditions at Port Reading are far from normal due to an embargo which was still on the latter part of the week.

There has been a noticeable change for the better in railroad service which, with an improvement in car supply as a result of the Interstate Commerce Commission order, tends to increase receipts of coal here.

Demand is strong in all directions and independents are besieged by bidders for shipments. Offers of as high as \$11.50 for the domestic sizes at the mines are said to have been made.

The steam sizes continue to occupy nearly the same position as last week, though they are easier. Buckwheat is not rushed with orders but there is no accumulation. Considerable of it is being used by bituminous consumers. Rice and barley are easier.

Quotations for the independent product at the mines range about as follows: Buckwheat, \$5.75; rice, \$4.50 and barley \$3.50.

Current quotations for company coals, per gross ton at the mine and f.o.b., New York Tidewater, lower ports, are as follows:

	Mine.	Tidewater.
Broken	\$7.40@7.55	\$9.25@9.40
Egg	7.40@7.55	9.25@9.40
Stove	7.65@7.90	9.50@9.75
Chestnut	7.70@7.90	9.55@9.75
Pea	5.95@6.35	7.70@8.10
Buckwheat	4.00@4.10	5.75@5.85
Rice	3.00@3.50	4.75@5.25
Barley	2.25@2.50	4.00@4.25
Boiler	2.50	4.25

Quotations for the domestic coals at the upper ports are generally 5c. higher on account of the difference in freight rates.

Bituminous—The permit regulations have resulted in less action here. Comparatively little coal is being moved from the local docks for local consumption unless it be on permit and for use by the public utility corporation. Demand is lighter but the average price is about as it was a week back.

Reports show that New York City was hard hit over the holiday period of three days, only 329 cars or a little over 16,000 tons having reached here, due to the lack of handlers at the docks. Because of a shortage the city was represented at the conferences held with the Interstate Commerce Commission at Washington the latter part of the week.

Car supply shows little change. Quotations vary according to supply and demand. Offers at the mine for Pool 10 coals range around \$12, while Pool 9 coals were slightly higher.

Considerable Pennsylvania coal is finding its way into New England by rail. With the towing situation improving larger shipments are expected to be made from this tidewater port.

Local quotations range from \$14 to \$15 at the piers with a couple of dollars added for loaded bottoms. Towing men report a growing demand for empty vessels.

PHILADELPHIA

Anthracite Situation Improves Slightly with Rail Betterment and Embargo Removal—Retail Prices Hold Firm—Steam Coal Is in Strong Demand, Especially Buckwheat—Local Bituminous Market Improves but Little—Price Varies Greatly—Longshoremen's Strike Ends and Large Tonnages Are Received for Export.

Anthracite—With an improvement of rail conditions, incident to the strike of freight men, the number of embargoes against shipments has decreased, but that against the city proper still prevails to those dealers located on the Reading tracks. A large number of the more extensive dealers are still without coal, a condition which has now lasted a month.

Some of the suburban dealers have been getting light shipments.

There is little likelihood that any heavy tonnage will be sent to local dealers, and the larger share of the production is going and will continue to go to more distant points. The situation on the Pennsylvania R.R. has so improved that all embargoes have been removed.

Despite the 10c advances made by the producing companies there has been little change in the retail prices, although with regular monthly increases, the full increase will amount to 50c on Sept. 1. The general scale is about \$13.50 for egg, stove and nut and \$10.50 for pea.

There is no particular activity among the consumers but the bulk of the order-

ing centers on stove; however, the consumers take a fair share of chestnut. There is still a light tonnage of pea coal in the yards.

The steam sizes are in a particularly favorable position. No doubt the high prices asked for soft coal have affected anthracite steam coals until buckwheat is difficult to obtain. Consumers with contracts are stocking up for winter. Rice grows in strength with each week, and now a fairly active market for barley has started up; but this latter size can stand almost unlimited demand before the stocks in storage need be called upon.

Bituminous—With the lifting of the various embargoes it was naturally expected that a larger tonnage of coal would arrive for the local market, but there has not thus far been any appreciable increase in receipts. The demand from local industries is not near so strong as it was earlier in the spring, as a number of plants are still curtailing production.

The variations in price are quite extensive and it cannot be said that there is really a market figure, although of late there is a tendency to market coal according to pool grades, with prices accordingly. Often pools 10 and 11 are grouped, with prices quoted for spot delivery from \$11.50 to \$12.50. We have heard of sales of pool 18 at \$10.50 and at times a trifle lower.

The above figures refer specifically to Pennsylvania coals, whereas Fairmont grades have been subject to more frequent variations, quotations running from \$8.50 up to \$12.75, but with most sales closer to \$11.75.

With the longshoremen's strike called off and the men going back to work almost as a unit, the effect on tide shipments is rapidly being felt. Despite the fact that the permit system for exporting coal is effective the yards are receiving increasingly large tonnages of coal, which is being allowed to go forward to foreign countries.

BALTIMORE

Federal Investigators Look Into Price Situation Here—Price Goes Up—Reserve Is Light and Big Fleet Awaits Tonnage—Permits Are Granted—New Retail Anthracite Schedule Becomes Effective—Receipts Are Light.

Bituminous—Armed with credentials of the Department of Justice, several Federal investigators are now at work here in the coal trade. In soft-coal lines, shippers and agents are being asked questions as to what they sell coal for, what they pay for coal at the mines, etc. Just what will come of it is a problem, but the coal trade does not look upon it over seriously.

There are many customers willing to take coal at high prices, and the operator does not have to quote prices, he merely asks what the consumer or other purchaser is willing to pay and accepts the proffer. The trade can see nothing illegal in that in a hotly competitive market. The farmer does the

same with his wheat, for instance, and no one says "No."

Prices are now around \$10 to \$11 f.o.b. mines on most sales of best coals that can be promised for quick delivery. But there is a wide range of the market, and sales much higher have been made; one noted here of Pool 10 (by no means the best classification) was at \$12.50 f.o.b. mines the net ton. Gas coals are selling possibly a little lower than steam coals just now, although quite strong.

The reserve at the pool is quite light, being around 1,500 cars at this writing, and that with more than 50 ships here waiting to take on close to 300,000 tons of coal. Relief in this direction is expected shortly as shippers are being granted permits.

Anthracite—The new schedule for retail sales of hard coal has become effective here. Sales are now being made as follows: Hard white ash—No. 1 (broken), \$13.75; No. 2 (egg), \$13.75; No. 3 (stove), \$14; No. 4 (chestnut), \$14.10; pea coal, \$11.25; buckwheat, \$8.70.

Lykens Valley—No. 2 (egg), \$14.70; No. 3 (stove), \$15.10 and No. 4 (chestnut), \$15.10.

Receipts here recently have been quite light. The embargo on the Reading has not been lifted as expected, and even the run of independent coal has fallen back in disheartening fashion to dealers who need supplies.

Lake

BUFFALO

Soft-Coal Situation Changes Little—Uneasiness Is Felt Over Possibility of Prosecution for Profiteering—Anthracite Situation Is Fair—Total Lake Shipments Are About Normal—Coke Still Goes Up.

Bituminous—The situation does not change as fast as one could hope; any change ought to be for the better, since what seems to be the bottom has been reached. Top notch prices have probably been asked. The consumer manages as a rule to get about what he needs by contract and bids high for the rest without much hesitation.

Much uneasiness is expressed over the possibility of trouble coming out of asking high prices for coal. Prosecution of Buffalo merchants has taken place where the provocation was much less than is sometimes the case in the coal trade.

It is held that the Government ought to define a fair profit quite as much as what a fair original price is. And now comes forward the shipper who asks why some of the public energy is not thrown into the building of cars, which would settle many difficulties. A shipper with a mine behind him says that he can get plenty of cars for rail coal, but next to none for commercial shipments.

The price of bituminous is all the

way from \$9 to \$11 at the mines for mine-run, which is now about all that is offering. To this should be added \$1.75 freight from Pittsburgh to Buffalo.

Anthracite—About the only feature of the trade is the continuous complaints of local consumers of the shortage. Coal in good amount is selling in the city and the prospect of a supply that is adequate for the city needs is at least fair. It will not do to allow the coal to remain here at the expense of the upper-lake trade. The Canadian consumer and dealer are also quite insistent.

The Lake shipments of anthracite for the week were 100,800 net tons, of which 34,400 tons cleared for Chicago, 21,700 tons for Milwaukee, 1,200 tons for Racine, 3,300 tons for the Sault and 40,200 tons for Duluth-Superior. Freight rates were \$1.50 to Racine, 65c. to Chicago, 60c. to Milwaukee and the Sault and 50c. to Duluth.

Shipments for June were 558,421 tons, which were about an even 100,000 tons over June last season. For the season to July the shipments were 1,019,542 tons, as against 1,247,000 tons to the same date last season.

Coke—Coke is still going up. Local jobbers report that they can get no foundry at the ovens short of \$18 and sometimes \$18.50 is asked, with \$17 for furnace. The small amount they can sell affords them little profit, so that they do not try to handle it, unless asked to by the consumer whose contracts do not turn him out what he needs.

Inland West

COLUMBUS

Strong Demand for All Grades Causes Prices to Mount Still Higher—Lake Trade Is Slow, Half Usual Tonnage Shipped.

The feature of the Ohio coal trade is the continued strong demand for all grades which has the tendency to make prices mount to still higher levels. Some of the larger operators and more conservative shippers are trying to hold the market in check but so far their efforts have been unavailing.

Prices are almost anything that the purchaser is willing to give and as a result there is a wide range. In the Hocking Valley prices range from about \$5 to \$8 and even higher on all grades. In the West Virginia fields prices for gas coal range around \$7.50 to \$9 and splints about \$8.50 to \$9.50. Kentucky prices are about at the same level.

Steam users are in the market for large tonnage and that is the principal reason for the high prices. There is a general scramble for all coal as soon as mined and purchasers are given instructions to get coal at any price. Railroads are taking a large tonnage for freight movement.

Retailers are also in the market as consumers are becoming anxious of their winter's fuel supply. Price with them is not the question as their customers are clamoring for coal. Retail prices have been exceedingly strong because of the higher prices at the mines.

The Lake trade is still slow and requisitions from the Northwest are far from being filled. Only about half of the tonnage usual for the time of the year is being shipped and there is little chance for an increase in the tonnage under present equipment conditions. Lake shippers are frantic and it is freely predicted that there will be an acute shortage.

Prices for coal at the mines are:

Hocking lump	\$5.00@ \$8.00
Hocking mine-run	5.00@ 7.50
Hocking screenings	4.50@ 7.50
Pomeroy lump	5.50@ 8.50
Pomeroy mine-run	5.00@ 8.00
Pomeroy screenings	5.00@ 7.50
West Virginia splints lump	7.00@ 9.00
West Virginia mine-run	7.00@ 8.75
West Virginia screenings	6.50@ 8.50
Pocahontas lump	7.50@ 10.00
Pocahontas mine-run	7.00@ 9.50

MILWAUKEE

Desperate Coal Situation Leads to Appointment of Commission to Appeal to I. C. C. for Relief—Competitive Bidding Keeps Prices Up—Receipts Are Far Behind Those of Last Year.

The coal outlook for this section of the country has become a desperate that, as Senator Irvine I. Lenroot's suggestion, a committee was named to go to Washington and make an appeal to the Interstate Commerce Commission for relief. The Commission will be urged to place an embargo on the export of coal.

The gravity of the situation cannot be exaggerated. The docks in the Northwest hold 5,000,000 tons of coal less than they did a year ago, and unless reserve stocks can be accumulated before the close of Lake navigation, then all factories must close.

Coal that could be bought for \$2 at the mines a year ago now commands \$3.50. Eastern dealers are invading the Illinois and Indiana coal fields with certified checks ready to bid against the Northwest and against buyers of export coal. This results in keeping prices steady.

Much interest is being given to the important conferences held at Washington.

The competitive bidding by buyers for export is also a serious menace to northwestern dealers. Coal is being refused to Lake boats because it cannot be spared by the large public utilities of the East and Middle West.

Hard coal is being delivered in Milwaukee quite freely by the dockmen, but the small dealers find it hard to supply their customers, as they are allotted only about ten tons each per week. The car situation continues bad and but little coal is coming by rail.

Receipts by Lake thus far this season aggregate 302,371 tons of anthracite and 283,299 tons of soft coal, against 306,099 tons of the former and 1,423,552 tons of the latter during the same

period last year, making a falling off against last year of 2,099 tons of anthracite and 1,025,257 tons of soft coal.

CHICAGO

Market Stiffens on Northern and Central Illinois Coals Due to Poor Car Supply—Southern Illinois Fuel Moves Under Contract—Indiana Coals Advance on Abnormal Demand—But Little Eastern Fuel Reaches Chicago—Arkansas and Oklahoma Coals Are a Factor Here.

The Chicago coal market continues to absorb whatever coal it is offered and premiums are being paid for spot coal. Current prices on spot coal are ranging from \$5.25 to \$6.50 per ton f.o.b. mines on central and northern Illinois coals with no differential between the price of lump, screenings or mine-run. Owing to the poor car supply in these Illinois fields the market on such coals has stiffened considerably during the past week.

Not much change has been noted on the current sales of the higher-grade fuels from Franklin, Saline, and Williamson counties, as prices are ranging from \$5.50 to \$7 per ton mines, according to the grade, quality and local condition of the market. Southern Illinois fuel continues in great demand with but little coal to take care of the markets; the bulk of the southern Illinois tonnage moving under contract.

There have been some advances on Indiana coals for current shipment. Indiana third-vein screenings are selling on the market at from \$4.50 to \$5, while mine-run has been selling at from \$5.25 to \$6. Coal from the fourth-vein districts continues to get top prices, as screenings are being sold at from \$5.75 to \$6.25; mine-run at from \$6.25 to \$6.75 and 1½-in. lump at from \$6.50 to \$7 per ton f.o.b. mines.

The byproduct people, as well as those engaged in the iron and steel business are responsible for the abnormal demand for Indiana No. 4 coals. Indiana fourth-vein coal is perhaps the best known byproduct coal coming into Chicago from either the Illinois or Indiana fields.

But little eastern coal is being brought into Chicago at the present time. It is understood that some West Virginia splint as well as Kentucky block were sold last week at prices ranging from \$7 to \$9.50 per ton f.o.b. mines, according to the grade and quality. What little Pocahontas comes in moves on contract, the price ranging from \$4.50 to \$6 for mine-run.

Oklahoma and Arkansas smokeless coals are becoming a factor in the Chicago retail trade as the producers of these grades hope to replace West Virginia smokeless fuels.

A careful inquiry into the retail situation in Chicago reveals the fact that the retailers have more coal on hand at the present time than they have had during the past 90 days. This is quite encouraging and it is hoped within a short time the same statement will be made in regard to manufacturing plants.

MIDWEST REVIEW

Demand for Coal Continues Strong, the Car Supply Being Erratic—Extension Is Urged for 30-Day Coal-Car Order—Diversion of Fuel to Michigan Disturbs Midwest Markets.

The demand for coal continues strong, without the slightest sign of weakening, in fact, some grades of coal have, during the past few days, shown an advance of 25c. to 50c. per ton. The car supply apparently is improving to some extent, but the Middle West is so coal hungry that the extra tonnage derived from the improvement in the car situation is absorbed without affecting market conditions in the least.

The mines in the central Illinois field have not been receiving as good a car supply as heretofore; during the past sixty days, this field has been receiving a little better supply than the southern district, while now the southern field appears to have a temporary advantage.

In Indiana, reports from practically all of the producing fields show a little improvement. But the continuation of the car shortage is quite disappointing to the trade. Undoubtedly the Interstate Commerce Commission will see the necessity of extending the 30-day period. A number of prominent operators have gone to Washington to argue for this extension of time.

Some of the coal-carrying roads have lifted their embargoes against shipping coal into Michigan from Illinois and Indiana mines, and a large tonnage is being diverted into that state more or less at the expense of its neighbors, who, under ordinary conditions, furnish a market for Indiana and Illinois coals. Under ordinary circumstances Michigan buys its coal from West Virginia, Ohio and a little from Indiana.

Today the state of the market is so unsatisfactory to all concerned—producer, retailer and consumer—that the trade is doing everything it possibly can toward getting relief on the car question. The great cry of the Middle West coal trade today is—"Give the mines cars and the market will take care of itself."

ST. LOUIS

High Prices Still Prevail with a Shortage That Is Growing—Steam Sizes Are Most in Demand, and the Country Call for Coal Is Urgent—Railroad Service Is Poor and the Car Shortage Acute—Assigned Cars Cause Much Trouble and Dissatisfaction.

The greatest trouble right now in the Standard field is the assigned-car abuse. Some mines are hardly able to work at all on account of no cars and other mines are running four days a week. Some of the assigned cars are for railroad fuel and others for commercial coal and the carriers seem powerless to check the local condition. The railroads continue to take a good tonnage from the field.

All steam sizes are in the greatest demand, especially for outside territory.

The local steam trade is pretty well supplied at the present time, with no storage ahead.

- The local domestic situation is going to be tense in a short time. The public is not buying right now and the dealers are unable to get a sufficient tonnage for storage.

In the western part of the state usually depending upon Arkansas and Kansas coal, there is a call for Illinois coal for harvesting, and this is general throughout the territory west of the river.

Outside buyers still continue to pay from \$4.75@5.50 for steam and domestic sizes in the Standard field.

In the Mt. Olive field conditions are much better. The assigned-car evil is not prevalent here, with the exception of one short line road. The prices on this coal are being maintained at a circular as a rule from \$3 in St. Louis up to \$3.75 for outside equipment. Transportation in both fields is bad.

In the Franklin County field the circular prices, with a few exceptions, are well maintained. These average \$3.80 for domestic sizes. In the Williamson County field there is some difference in prices, some operators taking what the market offers.

In a general way the demand far outstrips the supply with indications pointing to conditions growing worse. No anthracite or smokeless coal is coming into the St. Louis market and nothing from Arkansas. Coke is entirely out of the market.

Retail prices are:

Cartersville coal.....	\$7.50@7.75
Mt. Olive.....	6.25
Standard.....	5.50@5.75
Anthracite egg and grate.....	14.45
Stove and chestnut.....	14.70

CINCINNATI

Rail Transportation Improves and Ohio River Favors Good Supply from W. Va.—Domestic Coal Sells at Comparatively Fair Price Here—Large Plants Delay Stocking at Present Market.

The way empties are rolling through the Cincinnati terminals (1,000 daily) for the coal fields, there is every indication that transportation difficulties are due for a change in this district. These cars right now are pretty important.

In Cincinnati, furthermore, there is a feeling of optimism over the fact that the present stage of the Ohio River will permit of a good quantity of coal being brought down from the West Virginia fields, which might delay a further advance in price.

Coal men in general have commended the Fair Price Commission for its efforts to have the people of the community buy coal at this time. Coal is selling in Cincinnati at a price that the public should take advantage of. Mine operators view with much satisfaction the efforts being made by the terminal officials here to hustle empties back to the mines.

Prices in all fields supplying the Cincinnati district continue on a high level,

owing to the scarcity of fuel available, and little or no efforts have been made by large plants to secure reserve supplies. Better conditions are noticeable in Kentucky and West Virginia fields but in the Ohio district there is much to be desired.

DETROIT

Governor Sleeper Secures Extension of Order—Michigan Retail Coal Merchants' Association Is Organized To Bring Fuel Relief—Soft and Hard Coal Arrive in Small Volume.

Bituminous—Replying to the request from Governor A. E. Sleeper for an extension of the application of order 7, the Interstate Commerce Commission advises that coal from the eastern mining districts will be sent to Michigan in as liberal amount as possible.

Further developments in the effort to bring relief for the existing shortage of coal in Michigan, included the organization, during the week, of the Michigan Retail Coal Merchants' Association. This body was formed July 8 at a meeting of coal dealers in Lansing, Mich., nearly all the principal towns of the state having been represented.

This organization will try to influence the restoration to service in coal transportation the many cars built for that trade, which are being employed in moving other commodities.

The supply of bituminous arriving in Detroit is little more than adequate to meet current demands for supplying manufacturing plants. The quantity is insufficient to permit accumulation of reserves or to provide for requirements of retail dealers.

Anthracite—Shipments of anthracite are of small volume and arrive irregularly. Retail dealers are unable to obtain prepared sizes in sufficient amount to provide for the wants of their customers. Orders from household consumers booked months ago are still unfilled.

South

BIRMINGHAM

Car Supply on Southern and Frisco Is New 100 Per Cent, but Holiday Season Causes Heavy Loss in Output—Market Shows Sustained Strength.

While there has been a bountiful supply of cars on the Southern and Frisco lines the past week, all mines being furnished a 100 per cent supply, there has been no material improvement in production; in fact the output is very much off from the previous week, labor being badly demoralized by the holiday season, working forces being much depleted and irregular in reporting.

The shortage of coal is quite acute throughout Southern territory and industrial plants, railroads and utilities have little coal ahead of daily needs. The output from the mines is moved more promptly than in the past but

the supply is utterly inadequate to meet actual requirements due to the aforesaid operating difficulties.

Spot coal is practically an unknown quantity, the supply available coming from small operations and being negligible in its effect upon the market. A strong and active demand prevails for both domestic and steam grades, and but little new business can be taken on under existing conditions.

LOUISVILLE

Prices Are Firm on Good Grades of Coal—Inferior Fuels Find Decreased Demand—But Little Stocking at High Prices.

Slightly higher prices noted on some of the cheaper grades of fuel, but prices as a whole showing no material change. Demand steady, but producers of low grade steam coals not finding market quite as ready for fuel at present high levels.

Prices on gas coals and good non-gas steam coal continue steady, there being practically no change in the general situation. Strikes in some sections of Eastern Kentucky are affecting only a few mines, and as a result of the car shortage continuing severe, production is not being influenced, as such mines as are not affected by strikes are able to load all the cars they can secure.

Retailers report quite light stocking orders, and many inquiries for information as to when a price drop can be expected.

Quotations show Eastern Kentucky gas coal at \$8.75@9.50 a ton for mine-run; non-gas mine-run, \$8@8.50 a ton; Western Kentucky, block, \$6.25; mine-run, \$5.50@5.75; nut and slack, \$5.25.

Western

SAN FRANCISCO

Local Association Issues Announcement Urging Consumers To Buy Coal Now, While the Buying Is Good.

The Retail Coal Dealers' Association of San Francisco has issued a warning to all consumers of coal hereabouts to "buy now," thus making sure of a supply of the necessary fuel for next winter and saving on their bills.

The dealers announce: "A coal shortage is imminent. It will be more staggering in its consequences than any previous one. Immediate action is necessary to avert it. The best way to be sure of getting your coal supply is to buy now. This association does not say this in any spirit of forcing business, or from a purely selfish standpoint. But we know the dealers of San Francisco can give you coal now, and it is extremely doubtful if they will be able to give it to you later on."

The bituminous prices, f.o.b., mines, wholesale, Utah and Wyoming, per net ton, are as follows:

Stove and lump, \$4.50. The bunker price is \$13.55.

News From the Coal Fields

Northern Appalachian

FAIRMONT

Serious Transportation Conditions Prevail in Northern Fields of the State—Western Md. and B. & O. Railroad Strikes Cause Freight Congestion—Coal Shipped East Used by Railroad and Public Utilities.

Transportation conditions in the Fairmont and other northern West Virginia fields were by all odds much worse than in any other part of the state. Indeed, during the latter part of the week there was not more than a 25 per cent car supply and many mines were in idleness.

The principal reason for the reduced supply was found in strikes at various points on the Baltimore & Ohio and on the Western Maryland which had precluded the possibility of moving either loads or empties. As a result of the serious freight congestion on these railroads it is impossible to move empties into the northern West Virginia coal fields from the east.

Distribution of cars in and around Fairmont was also affected at the beginning of the week as the result of a strike covering a day or so among the yardsmen at Fairmont.

As a result of the scarcity of cars, approximately 10 mines or more in the Fairmont region alone were not working during the greater part of the week. Equal difficulty was experienced by mines in the Upper Potomac region and on the Monongahela.

Owing to the freight congestion such coal as the Baltimore & Ohio was able to handle eastward was for railroad use and for public utilities. Also there was not as heavy a delivery either to Inland West points or to the Lakes because cars were unavailable for such shipments.

CONNELLVILLE

Production Is Practically Stationary—Byproduct Ovens Increase Output—There Is Now Little Contracting for Coke—Fancy Prices Rule in Spot Market.

Car supplies in the Connellsville region on the day after Independence Day were quite heavy, on account of there being a two days' accumulation, and exceeded the number that could be loaded; but later in the week there was a decline again, and it is doubtful whether the week as a whole scored any gain.

As a matter of fact, despite various claims of improvement and counter claims that car supplies have grown much worse, the supplies week by week

have averaged approximately the same for a month or more past, and production continues at a fairly even rate, or about 70 per cent of the rate obtaining for several weeks prior to the inception of the series of rail strikes.

The byproduct ovens have been working much better in the past week or two, being fairly well supplied with coal, and several if not the majority have been operating practically full. The increased supply of coke has operated to increase the production of pig iron, and, thus far at least, has not reduced the demand in the open market for spot lots of Connellsville coke.

Predictions are made, however, that some of the recent buyers in the spot market are going to withdraw and confine their consumption to such coke as they secure without having to pay such fancy prices.

There has been little contracting for foundry coke of late, nearly all the business having been done some time ago. Reports are that a few small contracts have been made at about \$13, for the half-year, but these would hardly be representative of the market, since most of the business now in force was done some time ago at \$10@ \$11.

There is little interest in furnace coke contracts, on which about \$12 is now quoted. Spot prices are \$17@ \$18 for furnace and \$18@ \$18.50 for foundry, per net ton at ovens.

The Connellsville *Courier* reports production in the Connellsville and Lower Connellsville region in the week ended July 3 at 178,290 tons, a decrease of 7,320 tons.

PITTSBURGH

June Production Is Heavier Than in May—River Mines Did Well—Full Car Supply Order Practically Not Yet of Benefit—Spot Prices Remain High.

Coal production in the Pittsburgh coal district in June was at the rate of about 58 per cent of rated capacity, showing a fair increase over production in May. The railroad ratings total about two-thirds of the equipped capacity, the rating being made by proportioning actual production in the preceding month to the ratio that actual working time constituted to full time (counting eight hours to a day).

Both the river mines and the combination rail and river mines did well. The river mines, however, did not work at capacity, on account of labor shortage, and the case furnishes a good test of how much work miners in the district are disposed to do, the time put in by men at river mines in June being approximately 70 per cent of full working time.

Coal operators insist that thus far at least they have derived little observable benefit from Order 7 of the Interstate Commerce Commission requiring the railroads to give them full car supplies.

Spot coal prices are substantially as high as ever, open market transactions in the past few days showing the following spot market: Steam coal, \$8@ \$10; gas coal, \$10@ \$11; byproduct, \$9 @ \$10, per net ton at mine, Pittsburgh district.

Estimates of Production

FROM THE WEEKLY REPORT OF THE GEOLOGICAL SURVEY

BITUMINOUS COAL.

	1920		1919 (a)	
	Week	Calendar Year to Date	Week	Calendar Year to Date
June 19b.....	10,095,000	241,517,000	8,681,000	201,170,000
Daily average.....	1,683,000	1,659,000	1,447,000	1,382,000
June 26b.....	10,530,000	252,047,000	9,470,000	210,640,000
Daily average.....	1,755,000	1,663,000	1,578,000	1,389,000
July 3c.....	10,225,000	262,272,000	7,459,000	218,099,000
Daily average.....	1,704,000	1,664,000	1,492,000d	1,384,000

ANTHRACITE

	1920		1919(a)	
	Week	Calendar Year to Date	Week	Calendar Year to Date
June 19.....	1,803,000	40,092,000	1,753,000	36,800,000
June 25.....	1,820,000	41,912,000	1,855,000	38,655,000
July 3.....	1,730,000	43,642,000	1,394,000	40,049,000

BEEHIVE COKE

Week Ended		United States Total	
July 3	June 26	July 5	to Date
378,000	406,000	264,000	10,910,000
			9,773,000

(a) Less one day's production during New Year's week to equalize number of days covered for the two years. (b) Revised from last report. (c) Subject to revision. All figures in net tons.

NORTHERN PAN HANDLE

Order of I. C. C. Supplies Cars and Permits Output To Improve—Market Is Strong and Prices Hold—Eastern Ohio Increases Output.

Further impetus was given to production in the Northern Pan Handle of West Virginia during the period ended July 3, there was a car supply during the greater part of the week well in excess of 50 per cent, as compared with only about a 40 per cent supply during the previous week. Better transportation service was due to Order 7 of the Interstate Commerce Commission. Had the labor supply kept pace with the increased car supply, greater output would have resulted.

There was still an unceasing demand for the Northern Pan Handle product from every quarter, the market was still strong and there was no recession of prices.

Also in the eastern Ohio fields there was a much better run of cars during the week than usual, and mines in this section were able to increase their output.

Middle Appalachian**KANAWHA AND CABELL COUNTIES**

Suits Are Brought Against the Chesapeake & Ohio R.R. to Stop Assigning of Cars.

Legal action was recently taken in the circuit courts of both Kanawha and Cabell counties, W. Va., looking toward the issuance of an injunction or restraining order to stop the Chesapeake & Ohio R.R. from assigning cars. However, on July 6 notice was given that the Chesapeake & Ohio (made a defendant in both suits) would seek to transfer the suits to the jurisdiction of the Federal courts.

In Cabell County the Litz-Smith Coal Co. appeared as the plaintiff in conjunction with the Shamrock Coal Co., Litz-Smith Island Creek Co., Logan Mining Co., Buffalo Eagle Mining Co., Eagle Creek Coal Co., Sunbeam Coal Co., Aracoma Coal Co., and the E. R. Johnson Coal Mining Co. The plaintiff also seeks to restrain the use of privately-owned cars.

In the Kanawha field action against the Chesapeake & Ohio was taken by the Leevalle Coal Co., which has a plant on Coal River, the plaintiff company having the moral backing of all the companies in the region except those owned by the Chesapeake & Ohio.

KANAWHA

Kanawha Established Production Record on June 28—Open-Top Car Order Produces Results on C. & O.—Tide Is Again Reopened to High-Volatile—Middle West and Lake Shipments Increase.

The record for the present year was established in the Kanawha field, from

the standpoint of production, on Monday, June 28, when the mines supplied by the Chesapeake & Ohio in the field named had a 104 per cent car supply, production on that day reaching 40,000 tons, a gain of 13,000 tons over the previous Monday.

When throughout the week cars continued to flow into the field at an unprecedented rate, coal men began to believe at last that the long deferred improvement in the transportation situation had been brought about, and that the Interstate Commerce Commission order, having to do with the use of open-top cars, had become productive of results at last.

While C. & O. mines were making gains, the same was not true as to plants on the north side of the Kanawha, the Kanawha & Michigan having a very poor supply for its mines.

Enlarged transportation facilities came just in time to permit producers to take advantage of the reopening of tidewater terminals to their coal, an embargo of more than a week's duration being removed as to high-volatile coal, at least to the extent of utilizing permits previously issued.

It was the opinion of a number of operators that there was an increased western movement to Ohio, Michigan and other markets in the Middle West and possibly to the Lakes, though it is the opinion that red-tape requirements at the Lakes is putting a damper on Lake shipments.

POCAHONTAS AND TUG RIVER

Production Improves in All N. & W. Fields, Due to Improved Car Supply—Tug River Has Best Run of year, Increasing Shipments to Tide for Export—Mines Work Regularly in Pocahontas Region and Discourage Labor Agitators—Coal Flows West and to Tide in Fair Volume.

There was a rather marked improvement in all Norfolk & Western fields during the closing days of June in production, in so far as transportation facilities were concerned, the increase in the car supply being especially observable in the Pocahontas region.

As June came to an end there was (it is estimated) a car supply equal to between 60 and 70 per cent of allotment. Some districts on the N. & W. fared better than others, owing to the fact that the N. & W. was equalizing the supply for the month.

The West was furnishing a larger run of cars, apparently as the result of the Interstate Commerce Commission order governing the use of open-top cars for coal loading. While the tonnage shipped to tide was not as large as usual, embargoes were sufficiently modified to permit some coal to be consigned to tidewater terminals for export.

Tug River mines had an encouragingly large run of cars and the week was one of the best of the year from a production standpoint. Strikes at various points apparently had little effect on the Norfolk & Western.

Bunkerage and coastwise priority

regulations were lightened somewhat during the week and consequently Tug River producers found it possible to somewhat increase tonnage to tide for foreign shipment. Western markets also shared in the increase in production from this field. Production in the Pocahontas region was little affected by labor agitation. The car supply for the week ended July 3 enabled Pocahontas mines to work between 60 and 70 per cent of full time capacity.

Since miners are able to work with a great degree of regularity and hence to earn more, organizers are not finding it easy to induce them to join the United Mine Workers organization; hence the increased car supply has stiffened the opposition to the organization of the Pocahontas region.

Somewhat more coal was flowing westward than in previous weeks, not only because of an increased supply of open tops from the West but also because of New England priority regulations. Also the recent priority order had been sufficiently modified to enable mines to send a fairly large tonnage to tidewater for foreign shipment.

LOGAN AND THACKER

Cars Are More Plentiful in Both Fields—Labor Trouble Slows Up Output in Thacker Field—Banner Week for Logan Field—Removal of Embargoes Gives Wide Distribution to High-Volatile.

While Logan mines were increasing production during the week ended July 3, Williamson fields mines were slowing up somewhat due to labor trouble, yet not to the extent predicted by organizers and officials of the United Mine Workers. On both the Norfolk & Western, which supplies the Thacker field, and the Chesapeake & Ohio, which supplies the Logan field, cars were more plentiful than had been true as to previous weeks. Shippers in both fields were able to secure a wider distribution of their product, owing to the removal of embargoes on high-volatile fuel.

Naturally with a strike in effect it was impossible for Williamson field mines to keep up to the total of about 90,000 tons produced during the week ended June 26, but there was not more than a reduction of 25,000 tons.

Of the 80 miles in the field, operated by 55 different companies, 29 mines were said to be operating full. At many other plants, operations were continued after the strike became effective on July 1, though not with a full force of men. Still the field produced 227 railroad car loads of coal on July 1 (or 11,350 tons), and 219 loads on July 2.

Practically all the mines in the Williamson field on the Kentucky side of Tug River, and more especially those on Pond Creek, were running full.

The six-day period ended July 3 was a banner week in the Logan field in point of production as compared with other like periods since the middle of April, the output going over the 200,000-ton mark. The additional car sup-

ply seemed to come from the West. There was an unusually large number of Chesapeake & Ohio cars coming back to the field.

With the opening of seaboard points to high-volatile coal, Logan fuel began to flow to tidewater again. Still the bulk of the output of the field was going to the West under contract, Lake shipments being comparatively small.

VIRGINIA

Production Improves in the Virginia Fields—One-Fifth of the Output Is Coked.

Figures indicate that there was, during the last half of June, a ten per cent improvement in car service in the Virginia coal fields, as toward the end of the month production was climbing upward. During the last weekly period of June there was an output of 151,658 tons as compared with 136,262 tons for the previous week, a gain of approximately 15,000 tons. However, 30,000 tons out of the total output were used for the manufacture of coke.

The port of Charleston, S. C., was still embargoed so that export shipments were practically at a standstill. Spot coal was moving as nearly as could be estimated at \$9 per ton.

NEW RIVER AND WINDING GULF

Car Supply Makes Increased Production Possible—Smokeless Shipments to Tide Embargoed on June 28 on C. & O.—Large Tonnage Goes West—Restricted High-Volatile Shipments Move East.

With a larger flow of cars than usual into the New River and Winding Gulf regions at the end of June and during the first three days of July, it was possible to increase production in these fields to a rather material extent; but the increased production availed little, so far as eastern shipments were concerned, because smokeless shipments to tidewater were under the ban after June 28, at least from mines located on the Chesapeake & Ohio R.R. It was the larger supply on the C. & O., however, which made the increase in production possible.

Gains were recorded in the New River field, as compared with the period ended June 26, by virtue of the increased car supply. Production showed a decided upward trend, it being estimated that the output reached about 50 per cent of potential capacity.

As far as tidewater was concerned however, there was no increase in shipments. In fact there was a very small tonnage of New River smokeless shipped to tide because of an embargo imposed as the week began. Anticipating such an embargo, operators, before it became effective, began increasing their western shipments, so that during the week there was an unusually large tonnage of smokeless coal consigned to the West.

Although high-volatile coal was permitted to move eastward before the end of the week under certain restrictions,

such was not the case as to smokeless fuel.

Winding Gulf mines fared exceedingly well at the hands of both the railroads penetrating that field. There was to start with less than the usual excellent supply of cars available for mines located on the Virginian Ry., mines on that road being able to operate to only about 30 per cent of full time capacity. In a measure, however, the Chesapeake & Ohio succeeded in catching up with the Virginian in point of cars furnished, though none of the coal produced on its line could be shipped to tidewater; however, there was nothing to prevent Inland East shipments.

NORTHEAST KENTUCKY

A Slight Gain Is Made in Production—Most of Output Goes to the Lakes and to Inland Points—Demand Is Good and Prices Firm.

A gain of five per cent was scored in the production of coal in the Northeast Kentucky field during the week ended July 3. The total output for that week was 136,985 tons, or about 46 per cent of capacity, representing a gain of about 14,000 tons over the previous week.

While it would have been possible to have shipped a larger tonnage eastward, owing to the fact that the tide-water embargo had been lifted, yet (as has been the case in recent weeks) the largest market for northeast Kentucky coal has been in the West, and hence little effort was made to augment eastern shipments. The major portion of the output was consigned to points on the Lakes and to Inland markets in Ohio, Illinois, Indiana, etc.

Owing to the fact that production was still low, or at least curtailed, and that the demand was still as pronounced as ever, particularly for gas and steam coal, prices were as firm as ever.

Middle Western

INDIANA

Demand Far Exceeds Supply and Price May Be Increased—All Co-operate To Supply Threshers with Coal—State Has Great Difficulty To Get Fuel for Institutions.

The demand for coal in Indiana continues, with the supply entirely inadequate to supply the needs. Coal operators are not signing contracts because of the unsettled condition in the production field. The car supply is bad with little hope of it improving before fall. Retail dealers report that coal is almost impossible to get and as a result a further increase in price is looked for.

However, the general shortage will not affect wheat threshing in Indiana. Officials of the retailers' organization have stated that retailers have sufficient coal on hand to take care of this

work in their various communities and coal for threshing purposes will be given preference in sales. Recent correspondence shows the operators co-operating with dealers in all parts of the state and making a special effort to deliver coal that has been contracted for to serve threshers.

Some idea of the acute situation may be had from the fact that daily bids are being asked for by the State Purchasing Committee to supply coal for state institutions and only six have been received since the expiration of last year's contracts (July 1). Of this number, the state has been able to purchase only 21 cars.

Missouri Valley

THE SOUTHWEST

Present Car Shortage Threatens Texas, Oklahoma and Arkansas with Coal Famine Next Winter—Midwest and Northwest Now Bidding for Coal in Oklahoma and Arkansas.

Texas and Oklahoma are facing the most acute coal shortage yet experienced, according to coal men throughout these states, and the same opinion is expressed by miners, shippers and wholesale and retail dealers. The shortage is due directly to the present car shortage.

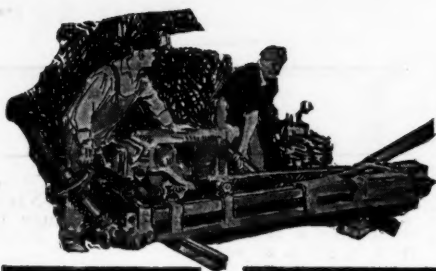
Whether Texas, Oklahoma and Arkansas have sufficient coal to keep warm next winter depends upon whether the present car shortage (which threatens to become worse) is relieved. Texas gets most of its coal from Oklahoma and Arkansas. Mines in those states now can not get enough coal cars to ship more than one-third to one-half their usual production. Texas can not hope to get much coal from distant fields, because the other fields, are, in varying degree, behind with their "home orders" also.

Chicago and St. Louis dealers are now bidding for coal on the Dallas market—an unprecedented situation. Nebraska, Minnesota and the Northwest have been for some time actively bidding for coal in the Oklahoma and Arkansas fields. Unless enough railroad cars are forthcoming to move coal contracted for by Texas dealers, Texas will face a most acute coal shortage next winter.

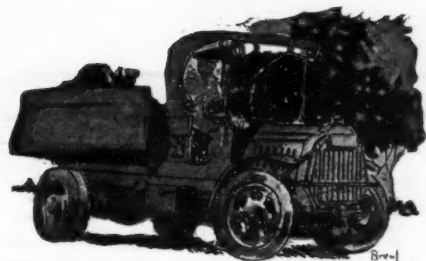
Regarding the country's coal production, R. W. Gardiner, a Pittsburgh operator, has prepared a statement pointing out that at the beginning of 1919 there were large stocks of coal on hand, while at the beginning of this year there was none.

R. W. Gardiner shows that the Pittsburgh district has produced much less this year than last, the following being the percentages of operation for the two quarters and the half year as a whole:

	1919	1920
First quarter.....	50	52
Second quarter.....	66	34
Half year.....	57	43



Mine and Company News



ILLINOIS

Carlinville—The Standard Oil Co. is now putting on the finishing touches at its two mines near this place in Macoupin County, which have been under construction for the past two years. A number of Standard Oil officials recently inspected the two properties with Mr. Manbeck, general manager. The development work is to be done by the Hunt Engineering Co., of Chicago, and engineers are expected to arrive soon at the two mines to start the different entries from the shaft bottoms. The Standard Oil Co., is also erecting a large power plant near the site of one of the mines which will furnish power for both plants. The cost of these two operations will run high into the millions of dollars as each mine is equipped with the most modern equipment.

INDIANA

Evansville—The tippie and engine house of the Sargeant coal mine No. 2 at Newburg, Ind., ten miles east of here, were destroyed by fire on June 8, with a loss of about \$20,000. Only the washhouse and blacksmith shop were saved. The fire originated in the engine room.

KENTUCKY

Louisville—A tippie and power plant of the Louisville Gas & Electric Co.'s mines at Echols, Ky., was destroyed by fire on June 16, throwing the operation out of commission, and putting over 100 men out of work. The plant was producing an average of 12 to 14 cars of coal a day, which was shipped in company cars. The plant will be rebuilt at once.

Ashland—A \$500,000 corporation has been organized to develop coal land here. It is known as the Porter Mining Co., and its officers are J. E. King, president; M. M. Collins, vice president; S. S. Porter, secretary-treasurer and general manager. The new development will cover a tract of 1,000 acres of virgin coal land leased from the Beaver Creek Consolidated Coal Co., Huntington, W. Va. The plant will have a daily tonnage of from about 1,500 to 2,000.

OHIO

Piney Fork—The Piney Fork Coal Co., which has been a stripping operation pure and simple since its start several years ago, will soon open a drift mine. A part of the acreage, which is along the Wheeling & Lake Erie R.R., is covered with a rather

heavy overburden, and it was believed best to mine underground. The drift mine will be opened within a few weeks and it is expected eventually to secure a daily capacity of about 1,500 tons from the plant.

PENNSYLVANIA

Wilkes-Barre—A pocket of gas was ignited recently in one of the workings of the No. 9 colliery of the Lehigh & Wilkes-Barre Coal Co., at Sugar Notch, shortly after eight o'clock in the morning and two men were painfully burned. Although some damage was done by the explosion it was not sufficient to force the mine to close down.

A rather bad disaster visited the village of Inkerman near here last Saturday when an explosion took place in the mines of the Pennsylvania Coal Co., at that place. The explosion occurred in the Marcy seam of the No. 6 shaft. Three men were killed and a number were overcome. The men that were affected were mainly on the rescue crew that tried to save the lives of those that were killed. A thorough investigation is being made as to the cause of the disaster.

Mauch Chunk—One hundred years ago, in this section, was the beginning of the great anthracite coal industry, which led to the formation of the Lehigh Coal Co. and the Lehigh Navigation Co., which corporations were later merged in the Lehigh Coal & Navigation Co., at present holding more than 12,000 acres of coal lands in Carbon, Luzerne and Schuylkill counties, and which mines and ships to market some 5,000,000 tons of coal annually.

The Carbon County Historical Society is making arrangements to commemorate this event. The exact date has not yet been fixed, but will take place late in the autumn.

It is said that anthracite was discovered at what is now Summit Hill (nine miles from here), brought down on wagons, and later over the famous Switchback Railroad to Mauch Chunk, where it was loaded into boats and taken to market by way of the Lehigh Canal.

Pottsville—The new outlaw strike of the yardmen of the railroads in this section affected the operation of the mines in the district. The mines were forced to shut down and were closed at last accounts. This badly affected the mines of the Philadelphia & Reading Coal & Iron Co., particularly those surrounding Pottsville.

Uniontown—H. A. Davis, Uniontown, has acquired a tract of coal property aggregating about 532 acres, formerly

held by W. Y. Humphries, for a consideration said to be about \$1,000 an acre. The land is located along Ten-Mile Creek, Greene County, and the seam is byproduct coal. The new owner plans to operate the tract.

Waynesburg—A deed was placed on record here recently for the transfer of almost 8,000 acres of coal in the vicinity of Clarksville, Green County, from J. G. Patterson, of Pittsburgh to the W. J. Rainey interests. Most of the coal lies in Green township between the forks of Ten Mill Creek. The consideration in the deed is \$1; but the deed contained \$3,000 in revenue stamps, indicating that the real consideration was \$3,000,000. The coal underlies twenty-seven different farms.

WEST VIRGINIA

Fayetteville—Holdings of the New River & Pocahontas Coal Co., in the New River field, have been materially increased by the purchase of two tracts of coal land aggregating 1,443 acres from the Low Moor Iron Co., the purchase price being close to \$235,000, it is said. Both tracts are on Wolf Creek, close to what is known as the Thurmond Coal Co.'s holdings.

One of the largest companies organized in the New River field in recent months is the New River Consolidation Coal Co., a million dollar corporation. While it is rather indicated that this company will operate in Shady Spring district of Raleigh County, the company is not yet in a position to announce the details of its organization and its plans for the future. The leading spirits in the company, it is known, however, are: G. A. McLaughlin, M. J. Moon, F. X. Carmody, Thomas F. Walsh and Thomas F. Casey, all of No. 2 Rector Street, New York, N. Y.

Brush Creek—The Easley Coal Co., recently incorporated with a capital of \$75,000, is planning for the development of over 1,000 acres of coal lands in this district. Considerable machinery for mining and general operation will be installed at an early date, and it is proposed to arrange for an output of close to 2,000 tons per day. Frederick Easley is president and general manager. R. J. Moss is construction engineer.

Huntington—At a cost of \$150,000, 100 four-room houses will be erected by the Glogora Coal Co., of this city. It is proposed to build 50 of such houses at one of the company's plants near Wayland, Ky., and the other 50 at the same company's plant on Coal River near Whitesville, W. Va.

Industrial News

Chicago, Ill.—The Mikesell Brothers Co., of this place, has recently purchased the asbestos and rubber factory, located at Wabash, Ind., of the Perfection Tire & Rubber Co. This is said to be the only asbestos textile plant located west of Philadelphia and includes 130,000 sq. ft. of floor space and in addition 34 acres of land available for expansion purposes. The brattice-cloth factory of the Mikesell company will be located at that point by the latter part of the year, in which will be made the following materials used in and around coal mines: Brattice cloth, water-proof duck; pipe covering and asbestos cements; asbestos and rubber packings; gaskets and pump valves; also insulating tapes and other items.

New York, N. Y.—An unusual affiliation of engineering firms took place some time ago, when the combination of the Westinghouse, Church, Kerr & Co., and Dwight P. Robinson & Co., Inc., was effected. In the newest announcement the statement is made that upon the completion of the merger with Dwight P. Robinson & Co., the new firm will be called the Westinghouse, Church, Kerr & Co., Inc., and its offices will be moved from 37 Wall St. to 125 East 46th St.

Kenosha, Wis.—The Winther Motor Truck Co., of this place, has broken ground for a large addition to its present plant. The new structure is 60 x 400 ft. on the ground and will be of modern saw-tooth construction, with concrete floors and brick walls. No labor-saving device or safety appliances have been overlooked in equipping this new addition, the entire plant being laid out for high-speed production. Chassis construction will still be carried on in the present plant, and the new building will be used only for final assembly, painting and inspection of Winther trucks and the Winther Six—the new passenger car. It is thought that the extra manufacturing space will permit the Winther company to more than double its present output.

Personals

Joseph Osler has been appointed as manager of the operations of the Hump Mountain Smokeless Coal Co., with headquarters at Humoco, W. Va., in the place of R. C. Taylor, resigned.

G. H. Marting, it is announced, has been made general manager of the Williams Creek Collieries Co., with headquarters at Harlan, Ky. Mr. Marting has been general manager of the plant of the Milburn By-Product Coal Co., on Paint Creek, W. Va.

Alex Herford has been designated as the manager of the plants of the Milburn By-Products Coal Co. on Paint Creek, W. Va., succeeding G. H. Marting, resigned.

James Sterratt, for some time general manager of the Main Island Creek Coal Co., has severed his connection with that company to become the manager of the Fire Creek Smokeless Coal Co., with headquarters at Leggo, W. Va., located on the Virginian Ry. in the Raleigh County, W. Va., field.

E. V. Warren, formerly with the Ender Coal & Coke Co., has joined the sales department of the Northwestern Coal & Coke Co.

Alexander W. Robertson, president of the Energy Coal & Supply Co., of St. Louis, operating several yards in Missouri and Illinois, was recently married to Miss Freda Hasslinger, daughter of Mr. and Mrs. Geo. C. Hasslinger. He was formerly in the offices of the Taylor Coal Co.

John F. Keenan, general manager of the Denny-Renton Coal & Clay Co., was elected president of the Manufacturers' Association of the State of Washington, by the board of trustees at a meeting held in Seattle, Wash.

A. J. Davis, of Tacoma, Wash., was elected president of the Washington State Fuel Merchants' Association, and **Roy Bungey**, of Spokane, was chosen vice-president. **W. B. Monks**, of Seattle, was the retiring president.

M. S. Leopold, 1346 Park Road, Washington, safety engineer for the Bureau of Mines, and **J. E. Monaghan**, of Frostburg, Md., had a narrow escape from death recently when the motor car in which they were riding backed through a fence and fell 20 ft. into Coal Lick Run near Uniontown, Md. Mr. Leopold jumped from the

machine, but Mr. Monaghan was pinned under the car, injuring one of his legs. Mr. Leopold was mainly instrumental in getting out the film, "The Story of Coal," for the Bureau of Mines and the National Coal Association.

Association Activities

Monongahela Coal Association

The Monongahela Coal Association has been organized by the operators of the Monongahela field, whose mines are on the Monongahela, the Morgantown & Wheeling and the Morgantown & Kingwood railroads. While a number of operators who constitute the new association were and are still affiliated with the Northern West Virginia Coal Operators' Association, it was felt a smaller and more local association should be organized for the purpose of dealing with car shortages and other problems of a rather local nature. It is also believed that the small organization will be more compact than one covering a larger field would be.

The officers of the new association are: **W. H. Soper**, of the Soper-Mitchell Coal Co., president; **S. F. Elkins**, of the Arana Coal Co., secretary.

Wheeling District Motor Coal Association

An order of the Baltimore & Ohio R.R. requiring all open-top cars on team tracks to be loaded from platforms has aroused the opposition of the Wheeling District Motor Coal Association, of Wheeling, W. Va., a special meeting of the association having been held on June 19 to consider the order requiring coal to be dumped from an elevation.

The new regulation of the Baltimore & Ohio, in the Wheeling district, affects loading (it is estimated) at 25 different motor coal mines, from which a large part of the domestic supply of fuel for Wheeling and its environs is derived.

Anything that affects the distribution of coal such as it is claimed the latest order of the B. & O. does, of course, affects the Wheeling supply and also makes it impossible to keep miners engaged.

As the new order was characterized as unfair and discriminatory in its nature, the Association reached a decision to resist it and to make a demand for fairer treatment. With that end in view it was decided to file a protest with the Baltimore & Ohio and with the Interstate Commerce Commission, and in the event no relief was secured to take the matter into the courts.

Northern West Virginia Coal Operators' Association

The suit brought in the Circuit Court of Marion County, by the Lamberts Run Coal Co., with the Northern West Virginia Coal Operators' Association acting as intervenor, to restrain the Baltimore & Ohio R.R. from assigning cars, has been removed to the Federal Court.

When the case came up for a hearing before Judge William S. Haymond on June 19 at Fairmont, W. Va., attorneys representing the railroad company made the plea that the suit involved an interpretation of the Federal law and that the railroad was only acting under authority of the Interstate Commerce Commission; on such a plea the railroad succeeded in having the suit transferred to the jurisdiction of a Federal Court. Judge Haymond entered an order for a transfer of the case to the district court of the Northern district of West Virginia.

Winding Gulf Operators' Association

Representatives of the Winding Gulf Operators' Association were present in force at Charleston, W. Va., during most of the week ended July 19, for the purpose of contesting the application of the Appalachian Power Co. for an increase in rates on the power furnished by it, upon which Winding Gulf mines largely depend. A public hearing was held by the Public Service Commission of West Virginia in connection with the Appalachian company's request for an increase. Although the Virginian Power Co. received a 40 per cent increase in rates less than a year ago, it is now asking for a 10 per cent additional increase. The Virginian company furnishes power to the mines in the Kanawha and New River, W. Va., fields.

Obituary

George Nester, for many years president of the Big Four Coal Co., Booneville, Ind., died at his home in that city on June 17, following a lingering illness. Mr. Nester was 58 years of age.

Thomas M. Clark, a resident of Highland Park, Ill., and one of the oldest coal men known in Illinois, died the first week in June at his home.

James Murphy, 54 years of age, retired coal operator of Belleville, Ill., recently took his own life when he hung himself in his barn behind his residence.

William Wayland, a pioneer coal mine operator, is dead after an illness of three years with miner's asthma. He was 78 years of age and resided in St. Louis from 1870 to 1882, at which time he moved to Danville, Ill.

Trade Catalogs

Railroad—Mining—Industrial

Catalog No. 6, Electric Service Supplies Co., Philadelphia—Chicago—New York. Pp. 607; 6 x 9 in.; illustrated. This cloth-bound catalogue covers electrical material for railroads, mines and industrial haulage systems. The main office, warehouse and factory of this company is located in Philadelphia; a warehouse and sales office is in Chicago; a branch sales office is in New York and there are additional sales offices in other cities.—Advertiser.

Welding and Cutting Equipment.—Davis-Bournonville Co., Jersey City, N. J. Catalogue. Pp. 15; 3½ x 6½ in.; illustrated. A description of oxy-acetylene and oxy-hydrogen welding and cutting equipment in the manufacture of which this company has been exclusively engaged.—Advertiser.

Roller Bearings, Trucks and Mine Cars. Railway & Mine Supply Co., Chicago, Ill. Bulletin 191. Pp. 24; 8½ x 11 in.; illustrated. A description of the equipment noted in the title of the catalogue together with drawings of cars, on which provision is made for filling in dimensions of equipment desired by possible purchasers.—Advertiser.

Coming Meetings

American Mining Congress will hold its annual meeting at Denver, Col., Nov. 15. Secretary, J. F. Callbreath, Munsey Building, Washington, D. C.

American Institute of Mining & Metallurgical Engineers will hold its fall meeting Aug. 20 to Sept. 3. It is proposed to leave Buffalo by steamer and cruise through the Lakes, the first stop being at Houghton, Mich., after which the party will visit Duluth and the Iron Ranges of Minnesota, spending a day or two in Minneapolis on its return. Secretary, Bradley Stoughton, 29 West 38th St., New York City.

New York State Coal Merchants' Association will hold its annual meeting Sept. 9, 10 and 11 at Richfield Springs, N. Y. Treasurer, G. W. F. Woodside, Albany, N. Y.

Illinois and Wisconsin Retail Coal Dealers' Association's annual meeting Aug. 4 and 5 at Milwaukee, Wis. Secretary, I. L. Runyan, Chicago, Ill.

The Rocky Mountain Coal Mining Institute, in conjunction with the Colorado Metal Mining Association, the local chapters of the American Mining Congress and the American Institute of Mining & Metallurgical Engineers, and the International First Aid Meet will hold its annual meeting Sept. 9, 10 and 11 at Denver, Col. Secretary, F. W. Whiteside, Denver, Col.

National Safety Council will hold its 1920 congress on Sept. 27 to Oct. 1, inclusive, at Milwaukee, Wis. General Manager, C. W. Price, Chicago, Ill.

Oklahoma Coal Operators' Association will hold its annual meeting Sept. 14 at McAlester, Okla. Secretary, F. F. La Grave, McAlester, Okla.